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DRAWINGS OF MILITARY STRUCTURES / BUILDINGS OR FEDERAL BUILDINGS
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Base Realignment and Closure Program Management Office West 1455 Frazee Road, Suite 900 San Diego, California 92108-4310

CONTRACT No. N62473-10-D-0809 CTO No. 0015

FINAL

ACCIDENT PREVENTION PLAN/ SITE SAFETY AND HEALTH PLAN November 2013

DCN: RMAC-0809-0015-0004

PARCEL E
SANITARY SEWER AND STORM DRAIN
RADIOLOGICAL REMEDIATION AND SUPPORT
HUNTERS POINT NAVAL SHIPYARD
SAN FRANCISCO, CALIFORNIA

Base Realignment and Closure Program Management Office West 1455 Frazee Road, Suite 900 San Diego, California 92108-4310

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FINAL

ACCIDENT PREVENTION PLAN/ SITE SAFETY AND HEALTH PLAN November 2013

PARCEL E SANITARY SEWER AND STORM DRAIN RADIOLOGICAL REMEDIATION AND SUPPORT HUNTERS POINT NAVAL SHIPYARD SAN FRANCISCO, CALIFORNIA

DCN: RMAC-0809-0015-0004

Prepared by:



TETRATECH EC. INC.

1230 Columbia Street, Suite 750 San Diego, California 92101-8536

Prepared by: Daniel Keenan, CSP Safety and Health Manager (415) 216-2750

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Concurrence: Roger Margotto, CIH, CSP, CHMM
Project Environmental Safety Manager

(619) 471-3503



November 6, 2013 RMAC-0809-0015-0004 5.0

Base Realignment and Closure Program Management Office West Attn: Ms. Catherine Haran 1455 Frazee Road, Suite 900 San Diego, California 92108

SUBJECT: FINAL ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH

PLAN, PARCEL E SANITARY SEWER AND STORM DRAIN

RADIOLOGICAL REMEDIATION AND SUPPORT, HUNTERS POINT

NAVAL SHIPYARD, SAN FRANCISCO, CALIFORNIA

Re: N62473-10-D-0809, CTO 0015

Dear Ms. Haran:

This letter serves to transmit one copy of the Final Accident Prevention Plan/Site Safety and Health Plan (APP/SSHP), Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support, Hunters Point Naval Shipyard, San Francisco, California, dated November 2013.

If you have any questions or require additional information, please do not hesitate to contact me at (415) 216-2731.

Sincerely,

Bill Dougherty Project Manager

Enclosure: Final Accident Prevention Plan/Site Safety and Health Plan,

Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support

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APPENDICES

Appendix A Activity Hazard Analyses

Appendix B Select Environmental Health and Safety Procedures (on CD only)

ATTACHMENTS

Attachment 1 Site Safety and Health Plan

ABBREVIATIONS AND ACRONYMS

AHA Activity Hazard Analysis

APP Accident Prevention Plan

Cal-OSHA California Occupational Safety and Health Administration

CCR California Code of Regulations

CHMM Certified Hazardous Materials Manager

CIH Certified Industrial Hygienist

CIRS Contractor Incident Reporting System

CPR cardiopulmonary resuscitation

CSIR Contractor's Significant Incident Report

CSO Caretaker Site Office

CSP Certified Safety Professional

CTO Contract Task Order

DON Department of the Navy

EHS Environmental Health and Safety

EM Engineer Manual

EWP elevating work platform

GHS Globally Harmonized System

HAZWOPER Hazardous Waste Operations and Emergency Response

MSDS Material Safety Data Sheet

OSHA Occupational Safety and Health Administration

PE Professional Engineer

PESM Project Environmental Safety Manager

PID photoionization detector

PiM Project Manager

PPE personal protection equipment

ROICC Resident Officer in Charge of Construction

RPM Remedial Project Manager

SDS Safety Data Sheet

ABBREVIATIONS AND ACRONYMS

(Continued)

SHM Safety and Health Manager

SSHO Site Safety and Health Officer

SSHP Site Safety and Health Plan

TtEC Tetra Tech EC, Inc.

1.0 INTRODUCTION

This Accident Prevention Plan (APP)/Site Safety and Health Plan (SSHP) refers to written procedures that are a part of Tetra Tech EC, Inc.'s (TtEC's) Environmental, Safety, and Quality Programs. The plan specifies the written corporate procedure by number. The cover page to this document has the signatures of the Certified Industrial Hygienist (CIH) and the Program Manager.

1.1 BACKGROUND INFORMATION

- a. Contractor: Tetra Tech EC, Inc.
- b. Contract Number: N62473-10-D-0809, Contract Task Order (CTO) 0015
- c. Project Name: Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support, Hunters Point Naval Shipyard, San Francisco, California
- d. The major field activities associated with the project include clearing of vegetation and pavement, geophysical investigations and utility clearance of excavation areas, establishment of soil and debris stockpile areas, excavation of impacted storm drain and sanitary sewer piping and associated components, surveys of soils at trench and radiological screening yard, post-excavation radiological sampling, backfill and compaction with non-impacted excavated soils or clean imported material, establishment of new storm drainage system/site restoration, and waste staging for disposal. Soil sample radiological analysis will be performed at the on-site accredited gamma laboratory. Other remedial activities to be performed may include removal of contaminated debris, equipment, or materials and may include removal of asbestoscontaining materials by an asbestos-certified subcontractor. The site is located at Hunters Point Naval Shipyard (Figures 1-1 and 1-2).

Phases of work requiring Activity Hazard Analysis (AHAs) (some tasks are part of a single AHA) are:

- Mobilization and Site Setup
- Demolition, Removal, and Recycling of Concrete and Asphalt
- Excavation of Soil, Pipe Removal, Backfilling, and Hauling
- Radiological Surface Surveillance
- Radiological Screening Yard Activities
- Asphalt and Concrete Paving
- Clearing and Grubbing
- Site Restoration and Demobilization

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2.0 STATEMENT OF HEALTH AND SAFETY POLICY

TtEC's goal is to maintain a safe and healthy work environment during the performance of the project activities. The SSHP, included as Attachment 1, has been developed to fulfill this goal and achieve the following objectives:

- Instruct TtEC employees and contractors on procedures to minimize the potential for injury or exposure to hazardous conditions.
- Train TtEC employees and contractors on the proper action to be taken if a hazardous condition cannot be avoided by engineering controls.
- Provide guidelines for emergency response for known hazards and hazardous situations.
- Specify actions required to comply with applicable U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), California OSHA (Cal-OSHA), and other state and local regulations or other requirements.

This APP is intended as a guideline that allows the Site Safety and Health Officer (SSHO) to respond to changing conditions and make professional judgments regarding the interpretation of monitoring data and related control measures. This APP also delineates health and safety responsibilities and assigns those responsibilities to project and office personnel. This APP and attachments must be on the project site at all times. All personnel on-site must receive training on this plan prior to performing any work on the project site. The TtEC Corporate Health and Safety Programs have a strong philosophy and policy regarding health and safety. Refer to the following exhibits:

- Exhibit 1 Environmental Safety and Quality Policy
- Exhibit 2 Corporate Health and Safety Program Procedures List
- Exhibit 3 Zero Incident Performance®
- Exhibit 4 Zero Incident Performance Pledge

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3.0 RESPONSIBILITIES AND LINES OF AUTHORITY

This section identifies the roles and responsibilities of TtEC personnel and contractors conducting field activities at the site. Personnel will be drawn from the company to ensure that managers and field representatives have the qualifications, training, and experience to safely conduct their respective tasks while also providing a safe work environment for contractors.

3.1 PROJECT ENVIRONMENTAL SAFETY MANAGER

The Project Environmental Safety Manager (PESM) will review and approve this APP and any amendments prior to their adoption. The PESM will assist with implementation of the APP and provide project support on health and safety issues. The PESM will consult with the Project Manager (PjM) if revision of this APP is required. The PESM will verify field personnel training, medical surveillance, and respirator fit test requirements. The PESM will advise the PjM regarding industrial hygiene concerns, interpretation and evaluation of analytical exposure data, and other safety related issues, as needed. Contractor health and safety plans will be reviewed by the PESM.

The PESM for the Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support at Hunters Point Naval Shipyard, San Francisco, California is:

Roger Margotto, CIH, CSP, CHMM TtEC Program Health and Safety Manager 1230 Columbia Street, Suite 750 San Diego, California 92101 (619) 471-3503 office (619) 988-0520 mobile roger.margotto@tetratech.com

3.2 PROJECT MANAGER

The PjM is responsible for ensuring that the APP and the SSHP are prepared, reviewed, approved, and implemented. The PjM will not initiate field activities until the APP and the SSHP have been approved by the PESM and assigned personnel have received the required level of project-specific health and safety instruction. The PjM will review and evaluate field and laboratory data as they become available during the course of the project and consult with the PESM and SSHO if revisions to the SSHP are required. The PjM is responsible for the overall health and safety performance and compliance with applicable regulations and is the senior contact in the event of a site emergency. In addition, the PjM will ensure that health and safety activities are conducted according to APP requirements and according to other, relevant company policies and procedures. On-site injuries, illnesses, and accidents will be reported to the client by the PjM, SSHO, or the PESM.

The PjM for the Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support is:

Bill Dougherty Project Manager Hunters Point Naval Shipyard San Francisco, California 94124 (415) 216-2731 office (415) 238-7006 mobile bill.dougherty@tetratech.com

3.3 PROJECT SUPERINTENDENT

The Project Superintendent coordinates all construction activities. The Project Superintendent is responsible for ensuring that all work is performed in accordance with the contract requirements in a safe and healthful manner. As a line manager, the Project Superintendent has the same responsibilities for health and safety program implementation as the PjM. The Project Superintendent will:

- Ensure that work crews have adequate resources to effectively conduct field activities.
- In conjunction with the SSHO, ensure that proper protective equipment is being used by all personnel.
- Ensure that appropriate disciplinary actions are taken when health and safety requirements are not being followed or when unsafe practices occur.
- Oversee work practices to verify that they are in accordance with this APP and the SSHP (Attachment 1 of this APP).
- Understand and be familiar with the APP/SSHP.
- Participate in the daily tailgate safety meetings.
- Observe project personnel for signs of chemical or physical trauma.
- Immediately notify the SSHO and the PESM of any illness, accident, injury, or nearmiss incident.
- Correct any hazards disclosed by project workers or the SSHO.

The Project Superintendent has the authority to suspend field activities if the health and safety of personnel are in danger. The Project Superintendent for the Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support is:

Dennis McWade **TtEC Project Superintendent** Hunters Point Naval Shipyard San Francisco, California 94124 (415) 216-2761 office (580) 670-0292 mobile dennis.mcwade@tetratech.com

3.4 SAFETY AND HEALTH MANAGER/SITE SAFETY AND HEALTH OFFICER

The Safety and Health Manager (SHM)/SSHO will be present on-site, as required, during the conduct of field operations and is responsible for all health and safety activities and the delegation of duties to the health and safety staff in the field. The SSHO is responsible for implementing the APP, ensuring that appropriate personal protective equipment (PPE) is used relative to the hazard that may be encountered, verifying that communication systems are in place, monitoring conformance with safety and emergency response procedures, giving safety briefings, seeing that safety equipment is maintained, and conducting safety drills and exercises. The SSHO or designee is responsible for the setup and execution of decontamination procedures. The SSHO has stop work authorization, which will be executed upon determination of an imminent safety hazard or potentially dangerous situation. Work cannot restart until clearance has been authorized by the SSHO.

The SSHO possesses the knowledge and experience necessary to ensure that all elements of the approved SSHP are implemented and enforced on-site. The TtEC SSHO has a minimum of 5 years of experience and has completed a minimum of 46 hours of additional specialized training in personal and respiratory protective equipment, program implementation, and in proper use of air monitoring instruments, air sampling methods, and interpretation of results. This includes the OSHA 30-hour Construction Safety course and a specialized 16-hour TtEC training course. Every SSHO is certified as having completed training in first aid and cardiopulmonary resuscitation (CPR) by a recognized organization (such as the American Red Cross Association). TtEC Environmental Health and Safety (EHS) Procedure 1-2 (EHS 1-2) states that the SSHO is responsible for:

- Ensuring that TtEC employees understand the requirements of TtEC EHS programs and procedures through training and communication
- Developing or assisting with the development of EHS plans in conjunction with project personnel

3-3

- Assisting management with EHS plan implementation
- Performing specific tasks in accordance with EHS plans

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• Fulfilling the specific responsibilities for project EHS personnel that are identified within each EHS procedure

Additional responsibilities of the SSHO, as described in the TtEC EHS program, include but are not limited to:

- Investigating accidents, injuries, illnesses, near-misses, and other incidents.
- Ensuring that employees are trained on the hazards of hazardous substances used on any project, maintaining Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) files to provide easy access to all employees, and performing inspections to ensure that all containers are labeled.
- Ensuring that the APP is read, understood, and signed by all field personnel including subcontractors. (The APP will be maintained and updated as needed, and one copy will be placed on or near the site safety bulletin board and postings.)
- Ensuring that tailgate safety meetings are conducted on days that work is performed. Ensuring that all meetings and any other additional training are documented.
- Assessing employee exposure through specified monitoring protocols and ascertaining that protective measures are appropriate.
- Verifying that project safety equipment is inspected, as required by the EHS program.
- Reporting to the Navy Remedial Project Manager (RPM) and Resident Officer in Charge of Construction (ROICC), within 24 hours, all incidents required to be reported by Engineer Manual (EM) 385-1-1 (USACE 2008); and reporting immediately to the RPM and ROICC if any fatal injury occurs, one or more persons are admitted to a hospital, or if damage to government property occurs.
- Informing the PjM of any site personnel with medical restrictions.
- Determining and posting emergency phone numbers and routes to medical facilities and arranging for emergency transportation to the medical facilities.
- Serving as the Project Hazard Communication Coordinator.

The SHM/SSHO for the Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support is:

Dan Keenan, CSP TtEC Site Safety and Health Officer Hunters Point Naval Shipyard San Francisco, California 94124 (415) 216-2750 office (415) 272-1015 mobile daniel.keenan@tetratech.com The Alternate SHM/SSHO for the Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support is:

Andrew Gorman
TtEC Alternate Site Safety and Health Officer
Hunters Point Naval Shipyard
San Francisco, California 94124
(415) 216-2737 office
(425) 241-0713 mobile
andrew.gorman@tetratech.com

3.5 WORK PARTY

Members of the work party, defined as personnel and contractors working on the project, are required to comply with the health and safety requirements presented in this APP, in the SSHP (Attachment 1 of this APP), and, if appropriate, in their corresponding company health and safety manuals. The responsibilities of the work party members include, but are not limited to, the following:

- Read and understand this APP and the SSHP.
- Participate in daily tailgate meetings and any project-specific training.
- Implement safe work practices and good personal hygiene for hazardous waste operations.
- When unsafe conditions or work practices are observed at the site, stop the work and notify a supervisor.
- Maintain and use PPE in good working condition.
- Respond to site emergencies, if necessary, and direct evacuation or summon emergency assistance.

3.6 COMPETENT PERSONS

The competent persons designated by the PjM for fall protection are Mr. Dennis McWade and Mr. Daniel Keenan. The competent person designated by the PjM for excavation activities and rigging is Mr. Dennis McWade. The project requires that a designated competent person is onsite at all times when work is being performed. Qualified subcontractors will be used for electrical installation, asbestos-containing materials removal (if encountered), and other tasks identified in the AHAs.

3.7 PRETASK SAFETY AND HEALTH ANALYSIS

This plan requires the preparation of an AHA for each task. This plan also requires that these task analyses are reviewed with all workers and that workers acknowledge their review of safety and health requirements for each task. Where subcontractors are used to perform certain work

activities, the SSHO will ask the subcontractor to provide an AHA for review or the SSHO will work with the subcontractor in the preparation of the AHA for review. The AHA must be reviewed by the ROICC and the PESM. As new activities are identified or the work environment of the task changes, new or revised AHAs are prepared by TtEC. These revisions or new AHAs will be submitted to the PESM and the ROICC for review.

Each worker performing tasks described in an AHA must receive training in the AHA and be allowed to make comments and suggestions regarding the AHA to ensure that all hazards are properly identified and that control measures are in place to mitigate these hazards.

3.8 LINES OF AUTHORITY

Figure 3-1 shows an organization chart depicting the lines of authority.

3.9 POLICIES REGARDING NONCOMPLIANCE

TtEC has a discipline program that is discussed in all new employee orientations and is also written in the TtEC Project Orientation, Rules and Safety Guidelines Handbook (TtEC 2009), a booklet that is given to every company employee. Briefly, the rules implement a progressive disciplinary program. However, if at any time there is a significant compromise of safety procedures, immediate termination of an employee is allowed by the procedure. The SSHO will immediately report to the PjM and PESM observations of noncompliance in the performance of the subcontractor or workers.

3.10 MANAGER AND SUPERVISOR ACCOUNTABILITY FOR SAFETY

TtEC EHS 1-1 of the Corporate Safety Program requires that:

Line Management, the Project Manager, and supervisors, ensure that all company activities are executed in accordance with TtEC EHS programs, procedures, and applicable regulations. Line managers have primary EHS responsibility and have EHS personnel support to help them fulfill this responsibility.

4.0 SUBCONTRACTORS AND SUPPLIERS

4.1 IDENTIFICATION OF SUBCONTRACTORS AND SUPPLIERS

The principal construction subcontractors for the Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support, Hunters Point Naval Shipyard, San Francisco, California are:

- Radiological Survey & Remedial Services, LLC Health physics support, data evaluation, and radiological instruments
- IO Environmental & Infrastructure Data management
- Ten-wheeler dump truck and operators Out to bid
- Curtis and Tompkins, Ltd. –Radiological and chemical laboratory services
- TestAmerica-St. Louis (through IO Environmental & Infrastructure) Radiological and chemical laboratory services
- Kroeker, Inc. Asphalt recycling services
- Precision Locating, LLC Geophysical Survey
- ESP Surveying, Inc. Licensed land surveyor
- Tracer Environmental (through IO Environmental & Infrastructure) Air monitoring analysis

Subcontractors and suppliers anticipated during the course of the project include:

• Equipment Rental – Out to bid

4.2 MEANS FOR CONTROLLING AND COORDINATING SUBCONTRACTORS

TtEC directs the subcontractor's supervisor regarding the tasks to be performed and the manner in which the tasks are performed. Subcontractors are responsible for assigning specific tasks to their employees; ensuring that their employees are properly trained and are in compliance with applicable regulations; and allocating sufficient time, materials, and equipment to safely complete activities in accordance with this APP, the SSHP (Attachment 1 of this APP), and their individual health and safety plans.

4.3 SAFETY RESPONSIBILITIES OF SUBCONTRACTORS AND SUPPLIERS

This APP recognizes that projects such as this require that subcontractors and suppliers become involved during the course of the project. All subcontractors are responsible for compliance with this APP, the SSHP, and other applicable regulations. Subcontractor personnel must receive a briefing from the SSHO prior to unescorted access to the project site. They must fulfill the requirements established by this plan. They must acknowledge receipt of the plan and the hazard

communication briefing. On-site subcontractors are responsible for providing their personnel with appropriate PPE as specified by the plan. Subcontractor and third-party personnel have the authority to request a work area hazard assessment by the SSHO prior to the commencement or continuation of work. Any member of the work party observing an imminent safety hazard or potentially dangerous situation will immediately suspend field activities.

Most subcontractors have their own health and safety plans and/or company policies that are specific to their specialty services. TtEC management is responsible for making sure that subcontractor employees follow the policies and procedures of TtEC, the APP, and the SSHP. If subcontractor safety plans are more restrictive, the subcontractor supervisors must ensure that their safety plans are also followed.

Hazards not listed in this APP but known by the subcontractor, or known to be associated with a subcontractor's specialty, must be identified by and addressed in the subcontractor's health and safety plan and during the daily tailgate meeting prior to beginning work. The subcontractor will inform the SSHO and the PjM. The subcontractors will also develop AHAs for review by the SSHO and the PESM or they will coordinate the completion of AHAs with the SSHO for subsequent review by the PESM.

5.0 TRAINING

All personnel will have had and be current in Hazardous Waste Operations and Emergency Response (HAZWOPER) training. HAZWOPER training is maintained by attendance at an 8-hour annual refresher training class. All new TtEC employees receive new employee training as required by corporate Human Resources and as specified in the Project Orientation, Rules and Safety Guidelines Handbook. Other training required on this project includes the following.

5.1 MANAGER/SUPERVISOR TRAINING

In accordance with 29 *Code of Federal Regulations*, Section 1910.120 (8 *California Code of Regulations* [CCR] 5192), on-site managers and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive training as required above. In addition, they will receive at least 8 additional hours of specialized training on topics such as, but not limited to, the TtEC safety and health program and the associated employee training program, PPE program, spill containment program, health hazard monitoring procedures and techniques, and other supervisory responsibilities regarding these programs.

5.2 SITE-SPECIFIC TRAINING

Prior to commencement of field activities, the SSHO will provide site-specific training to all personnel assigned to the site; this training will address the activities, procedures, monitoring, and equipment for the site operations. Training will include site and base layout, hazards, evacuation route(s), emergency services at the site, and the hazard communication program, and will highlight all provisions contained within this APP and the attached SSHP. This training will also allow field-workers to clarify anything they do not understand and will reinforce each individual's responsibilities regarding safety and health for their particular activity. If additional training is required for completion of field tasks during site work, the PESM or SSHO will either conduct the training or manage site personnel to ensure that tasks are conducted by appropriately trained personnel.

5.3 ON-SITE SAFETY BRIEFINGS

Project personnel and visitors will participate in daily on-site health and safety briefings conducted by the SSHO, or designee, to assist site personnel in safely conducting their work activities. Safety briefings will be conducted at the start of new work activities using AHAs, which are provided in Appendix A. The briefings will include information on new operations, changes in work practices, or changes in the site's environmental conditions. The briefings will also provide a forum to facilitate conformance with safety requirements, and identify performance deficiencies related to safety during daily activities or as a result of safety inspections, and review any events (such as near misses, injuries, or material release). Work will

be stopped and a safety briefing will be conducted following any event that could compromise the safety of personnel or the environment.

5.4 FIRST AID AND CPR

The SSHO will identify those individuals who have completed current first aid and CPR training. At a minimum, two persons including the SSHO will be current in CPR/first aid. The names of all CPR/first aid qualified workers will be posted on the site bulletin board and will be added to this APP when the project starts.

A first aid kit meeting the requirements of Cal-OSHA (8 CCR 5812) and EM 385-1-1, Section 03.B.01 (USACE 2008), will be readily available at each work site by having the kit out and ready for use. The location of each first aid kit must be clearly marked, and kits will be protected from the weather and maintained clean. The kit must contain all the items listed in Table 3-1 of the EM 385-1-1 manual and include one pocket mouthpiece or CPR barrier and latex gloves. Items specified in 8 CCR 5812 and not specified in EM 385-1-1 will be added to the kit. The kit will be inspected weekly, and items will be replaced as they are used. Personnel trained in first aid and CPR will also have training in bloodborne pathogens and the protective measures to be used when providing CPR and first aid.

5.5 ASBESTOS AWARENESS

All individuals working on this site will receive asbestos awareness training at a minimum. Asbestos was commonly used when this site was active and may still be present in various forms. All employees will be trained in how to recognize commonly found asbestos-containing products, the original uses of it, the hazards associated with it, exposure limits and routes, and proper hygiene to minimize exposure.

5.6 LEAD AWARENESS

Lead-based paints can commonly be found on structures built before 1978. All employees on this project will receive awareness training on lead-based paint. The training will specify the hazards associated with it as well as regulatory exposure limits, routes of exposure, mitigation techniques, typical processes for creating respirable lead, and proper hygiene to minimize exposure.

5.7 RADIATION AWARENESS

Per the radiological work license, all employees will receive, at a minimum, radiation awareness training when work-related radiation exposure is a possibility. More detail on this training can be found in the Radiation Protection Plan provided as an attachment to the Parcel E Execution Plan (TtEC 2013).

6.0 SAFETY AND HEALTH INSPECTIONS

EHS 3-3, EHS Inspections, describes various inspection programs within TtEC. The procedure employs the use of checklists and requires daily, weekly, monthly, and quarterly or semiannual inspections. Weekly inspections and the monthly inspection are documented on a form that is part of EHS 3-3. Daily inspections and any deficiencies are noted on a deficiencies log as required by EM 385-1-1, Section 01.A.12d. The weekly inspection is conducted by the Project Superintendent, and the monthly inspection is performed by the PjM. The inspections are tracked for follow-up action on each of the respective forms. The monthly inspection is submitted to the PESM (a CIH) for review and follow-up. The PESM may conduct unannounced inspections at any time and will conduct the quarterly/semiannual inspections. The PESM submits the inspection report to the SSHO, PjM, and Program Manager.

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7.0 ACCIDENT REPORTING

The PESM calculates exposure data monthly. Man-hours worked are obtained from hours charged to a project for payroll purposes. TtEC also collects the number of man-hours worked by subcontractors on project sites by reviewing daily production reports and recording the hours on those reports. TtEC has an experience modification rate of 0.76. OSHA 300A forms are available for inspection. The chart below shows the TtEC OSHA Total Recordable Incident Rate and the Days Away/Restricted Duty/Transfer Rate for the last 3 years. TtEC's rates are substantially lower than the national averages as noted in the latest published rates of Bureau of Labor Statistics.

	NAICS 237990 Heavy Construction Other than Highways 2011	TtEC 2010	TtEC 2011	TtEC 2012
Total Recordable Incident Rate (TRIR)	3.5	1.32	0.92	0.30
Days Away/Restricted Duty/Transfer Rate (DART)	2.0	0.24	0.35	0.15

Abbreviations and Acronyms:

NAICS - North American Industry Classification System

TtEC - Tetra Tech EC, Inc.

EHS 1-7, Event Reporting and Investigation, details the procedures and the forms used by TtEC for investigations and reports. When an incident occurs, the site Project Superintendent/SSHO (Mr. Dennis McWade/Mr. Dan Keenan) will verbally notify the PjM (Mr. Bill Dougherty) immediately. The PjM must notify the Program Manager. The Project Superintendent/SSHO will notify the PESM (Mr. Roger Margotto). If the incident is an injury requiring more than first aid or if property damages exceed \$2,000, the PjM will immediately notify the Navy RPM and the ROICC.

After the verbal report, the Project Superintendent/SSHO must complete a written TtEC event report form within 24 hours. This form can be either prepared manually using the form found in the company procedure or the form can be completed electronically using a corporate TtEC database. Within 72 hours, a completed investigation report must be submitted. The investigation report is part of the initial written report form. These forms can be completed by persons involved in the incident, except that the investigation must be completed by a supervisor and/or the SSHO. All reports are reviewed by the PjM and the PESM upon submission. Within the reporting system, corrective actions and persons responsible for those corrective actions are identified. Corrective actions will be implemented as soon as reasonably practical. The system

requires follow-up to ensure completion of corrective actions. In addition, the PjM or the SSHO will complete a Contractor's Significant Incident Report (CSIR) as required for any injury beyond first aid or for any damages of \$2,000 or greater. The Project Superintendent or the SSHO ensures that a report is prepared and the forms are completed as requested by the ROICC and/or the RPM. The CSIR will be submitted as soon as possible but no later than 5 days after the accident.

Immediate reporting of incidents is required within TtEC. In addition, the ROICC will be immediately notified by the PjM (or a designee) of an accident (see list below) that is required to be reported by EM 385-1-1. An accident that must be reported immediately to the ROICC is any injury requiring more than first aid or any government property damage in excess of \$2,000. For each reportable mishap described above, a verbal report will be made to the ROICC or RPM as soon as possible. If the RPM or ROICC determines that a follow-up report be submitted to the Department of the Navy's (DON's) electronic submittal system, the ROICC will enter the information provided in the Initial Notification form into the Contractor Incident Reporting System (CIRS). The CIRS will send a link and a password to the PjM via e-mail. The PjM will be required to access the CIRS and complete the report with all available information and resubmit the updated report online to Naval Facilities Engineering Command Southwest within 24 hours of receiving the link.

The following is a list of accidents or events to be immediately reported:

- Fatal injury/illness
- Permanent totally disabling injury/illness
- Permanent partial disabling injury/illness
- Three or more persons hospitalized as inpatients as a result of a single occurrence (Note: it is TtEC practice to inform its clients of any accident requiring hospitalization of its employees or subcontractors.)
- \$200,000 or greater accidental property damage or damage in an amount specified by U.S. Army Corps of Engineers in current accident reporting regulations (Currently, TtEC reports government property damage \$2,000 or greater.)
- Arc flash incident/accident that results in a Class A or B injury
- Three or more individuals become ill or have a medical condition that is suspected to be related to a site condition or a hazardous or toxic agent on the site

8.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY THE SAFETY MANUAL (AS APPLICABLE)

TtEC has established written corporate requirements for compliance with regulations and implementing TtEC policy to prevent accidents and injuries. This section describes how some of these programs are implemented specifically for this project.

8.1 LAYOUT PLANS

This project will utilize a temporary office trailer during fieldwork. After the removal action, the excavation will be backfilled and the site restored. Figure 1-2 shows the site layout and the area to be excavated.

8.2 EMERGENCY RESPONSE PLANS

Emergency response has been planned for injuries, explosions and fires, accidents, weather, earthquakes, and spills. The Emergency Response Plan for this project is contained in Section 12.0 of the SSHP (Attachment 1).

8.2.1 Procedures and Tests

In the event of an emergency situation such as fire or explosion, the SSHO or a supervisor will activate an air horn for approximately 15 seconds indicating the initiation of evacuation procedures. All personnel in both the restricted and unrestricted areas will evacuate and assemble near the support zone or other safe area as identified by the SSHO. Before the start of work at any project site, the SSHO will identify and mark the location of an evacuation assembly area for that project site. The location should be upwind of the site. For efficient and safe site evacuation and assessment of the emergency situation, the Project Superintendent or SSHO will have authority to initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SSHO must ensure that access for emergency equipment is provided and that all equipment that may cause combustion has been shut down once the alarm has been sounded. As soon as possible, and while the safety of all personnel is confirmed, emergency agency notification will commence. The SSHO will brief site personnel each day as to the location of the evacuation assembly area.

Before the start of work at the project site, the SSHO will establish safe egress routes from the site to the evacuation assembly area (see Figure 12-2 in the SSHP). The SSHO will possess a drawing or map that diagrams these safe egress routes. The SSHO will use this same map to diagram egress from the evacuation assembly area to the facility gate to be used as an exit. From this point, the map showing the route to the nearest hospitals and clinic (Figure 12-1 in the SSHP) will be used if medical services are required. At the beginning of the project, the SSHO

will hold an emergency evacuation drill. The drill requires evacuation of the site to the assembly area. At the assembly area, the SSHO will brief the crew on the route that would be taken to exit the base and how to reach the hospital and clinics. After the drill, the SSHO and supervisors will prepare a short report and recommendations for the improvement of the evacuation plan and other emergency plans.

8.2.2 Spill Plans

In addition to training, the following procedures will be implemented to prevent and minimize releases of hazardous materials:

- Do not conduct hazardous materials operations when the weather could cause significant risk to the surrounding area if a spill should occur.
- Transfer all materials in or over a bermed or "protected" area. A protected area is one that is covered with an impermeable material, such as polyethylene. This includes fueling operations.
- Maintain a supply of basic spill response materials and protective equipment on-site to include:
 - Absorbent sheets, pillows, booms, or absorbent material
 - Open-top 55-gallon drums or other containers with lids
 - Brooms, shovels, and other tools, such as squeegees
- In the event of a spill, the Project Superintendent will notify the RPM and the Caretaker Site Office (CSO). The SSHO or PjM will notify the PESM. If the spill quantity is reportable to an agency, the RPM and the CSO will be informed. In no case will TtEC report a spill to an agency without the concurrence of the DON.

8.2.3 Firefighting Plan

Workers will not fight any fires other than incipient stage fires. This work area is an outdoor area. The only fires on the project site that could occur would be related to the vehicles and equipment used on-site. As stated in the fire prevention plan, there will be at least one dry chemical fire extinguisher rated minimum 6A:80BC at each open excavation work site where work is being performed. Fire extinguishers will also be mounted in each piece of heavy equipment (minimum 10-BC, per EM 385-1-1, Section 18.G.23) and in the crew pickup trucks (minimum 1A:10BC). The fire extinguishers are intended to fight only fires that have recently occurred and can reasonably be extinguished immediately. In no case will workers attempt to fight any fire that cannot reasonably be extinguished within 30 seconds to 1 minute (the fire extinguishers have only enough agent for small fires).

Prior to fighting any fire or during the course of fighting a fire, the San Francisco Fire Department will be called.

8.2.4 Posting of Emergency Telephone Numbers

Table 8-1, showing emergency contact numbers, is normally posted at a job site trailer. However, for a project such as this, the table is placed on clipboards, which are then placed on the dashboard of every vehicle used by the workers. Also on this clipboard will be a map (see Figures 12-1 and 12-2 in the SSHP) showing egress routes from the work site area to the local medical facilities.

8.2.5 Man Overboard/Abandon Ship

Not applicable.

8.2.6 Medical Support

At least two persons with current certification in CPR and first aid will be on-site during work activities. Each person will also have received training in bloodborne pathogens. Mr. Dennis McWade and the Field Engineer meet the requirements to provide CPR and first aid. Additional personnel on-site including subcontractor personnel will be identified and their names will be posted on the emergency notification log. Before the start of this project, off-site medical arrangements were made with a clinic. This clinic is under the review of TtEC's corporate medical provider as described in the SSHP.

8.3 PLAN FOR PREVENTION OF ALCOHOL AND DRUG ABUSE

TtEC has a Drug Free Workplace Program. All contractors and subcontractors on this project are subject to drug and alcohol testing at any time. Supervisors, managers, and the SSHO are to determine the fitness of their workers including whether their workers may be under the influence of any drugs or alcohol. This includes over-the-counter medications and prescription medications. At the beginning of the project, during the initial site orientation and training, all workers are reminded of the program and policies. The policy is also described in the Work Rules. Workers are encouraged to confidentially list their medications on a medical information form that is provided to them and retained by the SSHO. If a worker is involved in an accident or is injured, the worker(s) involved may be asked to be tested. If supervisors observe any worker who appears to be under the influence of drugs or alcohol, the supervisor may request testing of the worker.

8.4 SITE SANITATION PLAN

Portable toilets and a hand washing station will be provided on the job site. Toilet maintenance, provided by a vendor, will be performed at least once a week. The supervisor and the SSHO will determine whether more frequent maintenance is required. Workers will discard all food debris and other trash in a designated container. This container will be emptied at least once each week and taken to a waste management facility.

8.5 ACCESS AND HAUL ROAD PLAN

The use of heavy equipment for debris removal and lifting presents the greatest potential for injury to personnel. To minimize these hazards, the PjM and supervisor will designate routes for mobilization through the Hunters Point Naval Shipyard and establish specific traffic patterns. Trucks and heavy equipment will have spotters for backing maneuvers. Only qualified personnel will operate heavy equipment. Those crewmembers directly involved with spotting for the operator are the only personnel allowed in the vicinity of the heavy equipment. All others will remain a safe distance away from these operations. Personnel needing to approach heavy equipment while it is operating will observe the following protocols:

- Make eye contact with the operator (and spotter)
- Signal the operator to cease heavy equipment activity
- Approach the equipment and inform the operator of intentions

TtEC personnel will follow all local traffic rules. Company vehicles will yield to bikes and pedestrians. Personnel working in areas subject to vehicular traffic (streets, parking lots, etc.) will wear high-visibility safety vests. Flashing lights or reflectorized barricades will be used for roads that are blocked due to equipment. Coordinate traffic management issues with the RPM and the CSO.

8.6 RESPIRATORY PROTECTION PLAN

Use of respirators may be required on this project since this is an excavation containing backfilled material that may have unknown debris or materials. Also there may be materials inside the pipes that are being removed. If unanticipated contaminants are encountered, the PESM and SSHO will determine whether respirators are required on this project. The respiratory protection program references EHS 5-2. For this project, the Program Administrator is TtEC's PESM, Roger Margotto, CIH. The Site Program Administrator is Dan Keenan, CSP, the SHM/SSHO.

Since each contractor is required to provide its own respiratory protection based on its company's program, the SSHO will inspect each respirator to ensure it is acceptable for use. The SSHO will ensure that required cartridges are available.

All properly trained and medically qualified personnel, as directed by the SSHO, will inspect their respirators, clean them as necessary, ensure proper function, and don as directed. Respirators will be full-face respirators with air purifying cartridges. There will be a record of a recent fit test with an agent such as isoamyl acetate, Bitrex[®], or irritant smoke. This fit test, following the protocols of the corporate written respiratory protection program (EHS 5-2) and Cal-OSHA, will have been performed within the last year of the day the respirator is used. If this

date is not current, the SSHO or the PESM must perform fit testing before workers can use respiratory protection.

All personnel will perform both negative and positive pressure respirator fit tests. If a respirator failure is noticed, it shall immediately be reported to the SSHO, and the defective respirator will be repaired or replaced.

In the event respirator repairs or replacement cannot be made, the affected employee shall be removed from the work area until such time that a properly functioning and fitting respirator has been acquired.

Each employee will ensure that his/her individual respirator is equipped with organic vapor/acid gas/P-100 combination cartridges. TtEC and its contractors are responsible for having replacement cartridges available on-site for their respective employees. The SSHO will contact the PESM for a respiratory cartridge change schedule based on the manufacturer of the respirator. This APP is prepared prior to the project, and thus the specific manufacturer of each worker's respirator is unknown. Also, the cartridge change schedule varies with the existing weather conditions at time of use. The change schedule is dependent on many factors including ambient temperature and humidity.

8.7 HEALTH HAZARD CONTROL PROGRAM

The primary health hazards associated with this project are chemicals present in the fill soil from the excavation. The SSHP describes an air monitoring program requiring that any work within the excavation requires air monitoring for organic vapors using a photoionization detector (PID), and for flammable gases and oxygen levels use an oxygen/combustible gas meter to measure lower explosive limits of any gases or vapors. The plan requires the SSHO to continuously monitor the area around all work on the pipeline. Organic vapor levels that exceed 10 parts per million as measured by the PID will require the SSHO to temporarily stop work, to evaluate the source, and to evaluate whether work may resume or where respiratory protection may be required. The SSHO will contact the PESM for additional guidance to protect the workers. During the course of the project, while excavating and during material handling, site dust control measures will be used. Soil will be sprayed with water to prevent visible dust.

8.8 HAZARD COMMUNICATION PROGRAM

At the time of the preparation of this APP, the specific hazardous materials or chemicals that will be brought onto the project site are not known. When any material or chemical is brought onto the site, MSDS/SDSs will be provided to the SSHO. Materials that may be brought on-site include fuels and lubricants for equipment, dust suppressant, and others.

The SSHO will file the MSDS/SDSs in a notebook that will be available in the temporary office trailer or in the SSHO vehicle. The SSHO will review the MSDS/SDSs with the workers, and

this training will be documented on the daily safety meeting form. All workers will have general hazard communication training that specifically requires that workers notify the SSHO when any new material is brought onto the site and how the program is managed on the site. The corporate program is used as a reference (EHS 4-2).

All containers will be labeled as to content and hazards of the material in the container.

In 2012, the new Globally Harmonized System (GHS) for hazard communication was adopted, and U.S. implementation is scheduled to be complete by June 2016. Part of the implementation requires chemical manufacturers to switch from MSDSs to SDSs. Over the course of this project, the MSDS/SDS collection on-site is expected to include either or both variations of the hazard documents as they are released by the manufacturers. Full implementation of this GHS standard is not required until after the period of performance for this contract has ended.

8.9 PROCESS SAFETY MANAGEMENT PLAN

Not applicable.

8.10 LEAD ABATEMENT PLAN

Not applicable.

8.11 ASBESTOS ABATEMENT PLAN

Not applicable. A licensed subcontractor will be used for any asbestos-related work. The subcontractor will provide a written plan prior to performance of any work. This plan will be submitted to the PESM and the ROICC for review and acceptance.

8.12 RADIATION SAFETY PROGRAM

The radiation safety program is site-specific and can be found in the Parcel E Execution Plan (TtEC 2013).

8.13 ABRASIVE BLASTING

Not applicable.

8.14 HEAT/COLD STRESS MONITORING PLAN

There is a potential for heat stress and related injuries during work activities. The heat stress monitoring procedures for this project are presented in Sections 4.2.1 and 7.1.6 of the SSHP (Attachment 1 of this APP).

8.15 CRYSTALLINE SILICA MONITORING PLAN (ASSESSMENT)

Not applicable.

Hunters Point Naval Shipyard, San Francisco, California
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8.16 NIGHT OPERATIONS LIGHTING PLAN

Not applicable.

8.17 FIRE PREVENTION PLAN

The fire prevention measures for this project are presented in Sections 10.2.3 and 12.8 of the SSHP (Attachment 1 to this APP). Additional fire prevention measures are given in the AHAs developed for this project.

8.18 WILD LAND FIRE MANAGEMENT PLAN

Not applicable.

8.19 HAZARDOUS ENERGY CONTROL PLAN

Control of hazardous energy during installation, start-up, and maintenance will follow TtEC EHS 6-4 and OSHA 1910.147 and is addressed in Section 4.3.7 of the SSHP.

8.20 CRITICAL LIFT PROCEDURES

Not applicable.

8.21 CONTINGENCY PLAN FOR SEVERE WEATHER

Hazard mitigation measures for severe weather are presented in Section 4.2.3 of the SSHP. Additional protective measures are given in the AHAs prepared for this project.

8.22 FLOAT PLAN

Not applicable.

8.23 SITE-SPECIFIC FALL PROTECTION AND PREVENTION PLAN

A task on this project requires workers to perform work at heights of 6 feet or greater above the next lower level. This plan addresses the site-specific hazards.

8.23.1 Duties and Responsibilities

The competent persons for fall protection are Dennis McWade and Daniel Keenan, CSP. They have the responsibility to conduct initial inspection of all equipment used for work at heights 6 feet or greater above the next lower level. They will inspect all fall protection systems prior to installation and after installation. They will check all components of personal fall arrest systems and anchorages. They will provide training to all employees who work at heights and who use fall protection systems and those employees who use fall restraint systems. Mr. McWade and Mr. Keenan have had training and have experience with fall protection programs and systems. Mr. Keenan is a CSP.

8.23.2 Description of Project and Tasks

This project requires the use of elevating work platforms (EWPs) to conduct surveys over the excavations of pipelines. Use of EWPs in this manner reduces the risk of falling into excavations and gives the survey crew a secure anchor point while working on the platform.

8.23.3 Training Requirements

All workers will be trained in the safe use of a full-body harness and safety lanyard. They will be trained on how to connect to an authorized anchor point, how to move from one point to another point (if necessary), and the rules regarding work on an EWP and ladders.

8.23.4 Prevention and Control of Anticipated Hazards

Each task at heights is included in an AHA. The AHA describes the hazards and the control measures.

8.23.5 Rescue Plan and Procedures

All personnel using a full body harness with safety lanyards will be instructed on how they would be rescued if they are connected to and should fall from an anchorage point.

While working on an EWP, the rescue is easily achieved by carefully rotating the EWP to point where the worker can safely be lowered to the ground. Work on an EWP always requires at least two workers to be in or operating the EWP. Workers attached to a secured anchor point will fall no more than 2 feet and can be raised back onto the EWP platform or a work surface by nearby workers. (The buddy system requires that at least two workers are in any work area and that they have radio communication.)

8.23.6 Design of Anchorages

Anchorage points on EWPs are designed by manufacturers of the equipment. As part of the EWP inspection, these points are inspected for damages or other signs or defects. Horizontal lifeline systems are not planned for use on this project.

8.23.7 Administrative Controls

Daily inspections of the EWP and fall arrest systems are required and are documented on an inspection form. The SSHO will inspect personal fall arrest systems at least once each week. All safety harnesses and lanyards will be stored in designated areas and stored in a hanging position (not stored on the ground or lying flat on a surface). Any device that has been deployed will be removed from service and discarded. This includes the full-body safety harness as well as the used lanyard. When fall hazards are noted, workers are advised of these hazards at morning safety meetings, on site radios throughout the day, and also by use of barricades and signs.

8.24 DEMOLITION PLAN

Not applicable.

8.25 EXCAVATION/TRENCHING PLAN

The project requires the excavation of contaminated soil and replacement with clean backfill. No persons will enter any excavation. The SSHP, Section 4.3.12, describes all aspects of excavation safety. Compliance with Corporate Safety Programs EHS 6-3, Excavation and Trenching, and EHS 3-15, Underground Utilities, is also required.

8.26 EMERGENCY RESCUE (TUNNELING)

Not applicable.

8.27 UNDERGROUND CONSTRUCTION FIRE PREVENTION AND PROTECTION PLAN

Not applicable.

8.28 COMPRESSED AIR PLAN

Not applicable.

8.29 FORMWORK AND SHORING ERECTION AND REMOVAL PLANS

Not applicable.

8.30 PRECAST CONCRETE PLAN

Not applicable.

8.31 LIFT SLAB PLANS

Not applicable.

8.32 STEEL ERECTION PLAN

Not applicable.

8.33 SITE SAFETY AND HEALTH PLAN FOR HTRW WORK

In accordance with Section 28 of the EM 385-1-1 (USACE 2008), an SSHP for hazardous, toxic, and radioactive waste work has been prepared (Attachment 1 to this APP).

8.34 BLASTING SAFETY PLAN

Not applicable.

8.35 DIVING PLAN

Not applicable.

8.36 CONFINED SPACE

A confined space is any enclosed area having a limited means of egress where ventilation is not adequate to remove a toxic or flammable atmosphere or oxygen deficiency that may exist. Examples of confined spaces include, but are not limited to tanks, boilers, vessels, bins, manholes, tunnels, pipelines, underground utility vaults, and any open-top spaces more than 4 feet in depth such as pits, tubes, trenches, and vessels.

TtEC EHS 6-1 outlines confined space procedures in detail. No confined space entry is allowed per this plan. Prior to the start and during the conduct of each contract task order, the PESM, the SSHO, and the project supervisor(s) will identify confined spaces or confined spaces created by the nature of the work. The SSHO will not allow entry into these spaces. If a confined space requires entry after an SSHP has been approved but was not part of the original SSHP, the SSHP will be modified and approved per the amendment procedure described in the SSHP.

9.0 RISK MANAGEMENT PROCESSES

AHAs for the planned activities are included in Appendix A of this APP. If any new tasks are identified or if planned activities vary from the written AHAs, the SSHO will develop or alter the existing AHAs with the assistance of the workers and subcontractors to address the specific activities. All AHAs will be reviewed by the PESM and the ROICC.

AHA	Activity
1	Mobilization and Site Setup
2	Demolition, Removal, and Recycling of Concrete and Asphalt
3	Excavation of Soil, Pipe Removal, Backfilling, and Hauling
4	Radiological Surface Surveillance
5	Asphalt and Concrete Paving
6	Clearing and Grubbing
7	Site Restoration and Demobilization

10.0 REFERENCES

- Cal-OSHA (California Department of Industrial Regulations, California-Occupational Safety and Health Administration). Title 8 *California Code of Regulations* (CCR). Construction Safety Orders Sections 1600–1938 and General Industry Safety Orders, Sections 3200 6184.
- TtEC (Tetra Tech EC, Inc.). 2009. Project Orientation, Rules and Safety Guidelines Handbook. July.
- ———. 2013. Execution Plan, Parcel E Sanitary Sewer and Storm Drain Radiological Remediation and Support, Hunters Point Naval Shipyard, San Francisco, California. November.
- USACE (U.S. Army Corps of Engineers). 2008. Safety and Health Requirements Manual. Engineering Manual (EM) 385-1-1. September 15, Consolidated 2011 August.
- U.S. Department of Labor. Part 1910. Occupational Safety and Health Administration, Occupational Safety and Health Standards. 29 Code of Federal Regulations (CFR).

TABLES

TABLE 8-1

EMERGENCY INFORMATION

REPORT ALL FIRES, SERIOUS INJURY, OR UNCONTROLLED SPILLS IMMEDIATELY: 911 or (415) 861-8020 (from cell phone)

Clinic	From the corner of Galvez A gate. (The Innes Avenue ga continue northwest on Innes Continue on Hunters Point I Evans and turn right at 3 rd S	.m. – 6:00 p.m. (Monday – Fragren Avenue and Donahue Street, gotte is the only open gate to HI and bear right onto Hunters Boulevard, which becomes Extreet. Continue on 3 rd Street, and continue to Connecticut Street.	riday) go toward the main PNS.) Once on Innes, Point Boulevard. vans. Continue on past Cesar Chavez		
Hospital: San Francisco General or Saint Luke's Hospital	gate. (The Innes Avenue ga continue northwest on Innes Continue on Hunters Point I Evans and turn right at 3 rd S Cesar Chavez. Continue we 101 Freeway. Turn right on Hospital will be on the right	Avenue and Donahue Street, stee is the only open gate to His and bear right on to Hunters Boulevard, which becomes Extreet. Continue to Cesar Chaest under the 280 Freeway and Potrero to reach SF General to n 23 rd Street. For St Luke in left at the corner of Valencia	go toward the main PNS.) Once on Innes, Point Boulevard. vans. Continue on vez. Turn left onto d continue under the Continue on Potrero. 's continue on Cesar		
TtEC Medical Provider	WorkCare® (888) 449-778	7 Call for all medical relate	d cases, 24/7.		
Fire/EMS/San Francisco Police	911 – Emergencies Cell Phone: (415) 861-8020 911 calls from a cell phone do not go directly to HPNS emergency services, but through the California State Highway Patrol. Local Fire Department – Non-Emergency Battalion 10 Station 9 (415) 558-3209				
Hunters Point Police Patrol	(415) 559-9848 cell				
All site workers contact a superintendent or a manager in an emergency.					
TtEC Project Superintendents and Field Engineers	Dennis McWade (PS) (415) 216-2761 office (580) 670-0292 cell	Chris Hanif (PS) (415) 216-2762 office (510) 967-1710 cell	Andrew Gorman (FE) (415) 216-2737 office (425) 241-0713 cell		

TABLE 8-1

EMERGENCY INFORMATION

Bill Dougherty (PjM)	m.n.a.a. n		T 005 (1 -1-5			
Manager Shanti Montgomery (415) 218-2772 office (360) 320-8519 cell Shanti Montgomery (415) 216-2772 office (360) 320-8519 cell Self Ambrose (RSOR) (415) 216-2758 office (509) 260-1144 cell (757) 944-0921 cell Shanti Montgomery (415) 216-2758 office (509) 260-1144 cell (757) 944-0921 cell Shanti Montgomery (415) 216-2758 office (415) 216-2750 office (415) 216-2759 office (425) 241-0713 cell (PESM) (619) 471-3511 office (360) 980-0359 cell Solf (19) 471-3503 office (619) 471-3503 office (619) 471-3503 office (619) 532-0912 office (619) 532-0787 Shirley Ng (510) 521-8713 office (510) 772-8832 cell (510) 772-7639 cell Shirley Ng (510) 521-8713 office (510) 755-5878 cell (510) 755-5875 cell Shirley Ng (510) 521-8713 office (510) 755-5875 cell (510) 755-5875 cell Shirley Ng (510) 521-8713 office (510) 755-5875 cell Shirley Ng (510) 521-8742 office (510) 755-5875 cell S	TtEC Site Project Manager					
TIEC Radiological Screening Yard Manager						
Yard Manager	TITCD III . IC	` ′	(113) 313 2070 0011			
TEC Radiation Safety						
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(415) 272-1015 cell	·	(SHM/SSHO)	(Alternate SSHO)			
Richard Kanaya (PQCM) (415) 216-2759 office (415) 516-9583 cell						
Quality Control (415) 216-2759 office (415) 516-9583 cell		, ,	(425) 241-0713 cell			
TEC Program Managers						
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CSP		(300) 700 0337 ccn				
CSP	TtEC Corporate Health	Erik Abkemeier, CHP, PE,				
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NAVY ROICC Shirley Ng	NAVY CSO	Doug DeLong	Mel Asuncion			
NAVY ROICC Shirley Ng (510) 521-8713 office (510) 521-8742 office (510) 755-5878 cell Andrew Uehisa (510) 521-8742 office (510) 755-5875 cell National Poison Control Center (800) 222-1222 National Response Center (800) 424-8802 RCRA Hotline (800) 424-9346						
(510) 521-8713 office		(510) 772-8832 cell	(510) 772-7639 cell			
(510) 521-8713 office	NAVY ROICC	Shirley Ng	Andrew Uehisa			
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Center (800) 222-1222 National Response Center (800) 424-8802 RCRA Hotline (800) 424-9346		(510) 755-5878 cell	(510) 755-5875 cell			
National Response Center (800) 424-8802 RCRA Hotline (800) 424-9346	National Poison Control	(900) 222 1222				
RCRA Hotline (800) 424-9346	Center	(000) 222-1222				
	National Response Center	(800) 424-8802				
SF ICE # (415) 861-8020 (SFPD alternate emergency number)	RCRA Hotline	(800) 424-9346				
	SF ICE #	(415) 861-8020 (SFPD alternate emergency number)				

Abbreviations and Acronyms:

CHP – Certified Health Physicist

CIH – Certified Industrial Hygienist CSO – Caretaker Site Office CSP – Certified Safety Professional EMS – Emergency Medical Services

FE – Field Engineer

HPNS – Hunters Point Naval Shipyard

TABLE 8-1

EMERGENCY INFORMATION

Abbreviations and Acronyms (Continued):

ICE – in case of emergency

PE – Professional Engineer

PESM - Project Environmental and Safety Manager

PjM - Project Manager

PM – Program Manager

PS – Project Superintendent

QC – Quality Control

RCRA – Resource Conservation and Recovery Act

ROICC – Resident Officer in Charge of Construction

RPM - Remedial Project Manager

RSO - Radiation Safety Officer

RSOR - Radiological Safety Officer Representative

SF - San Francisco

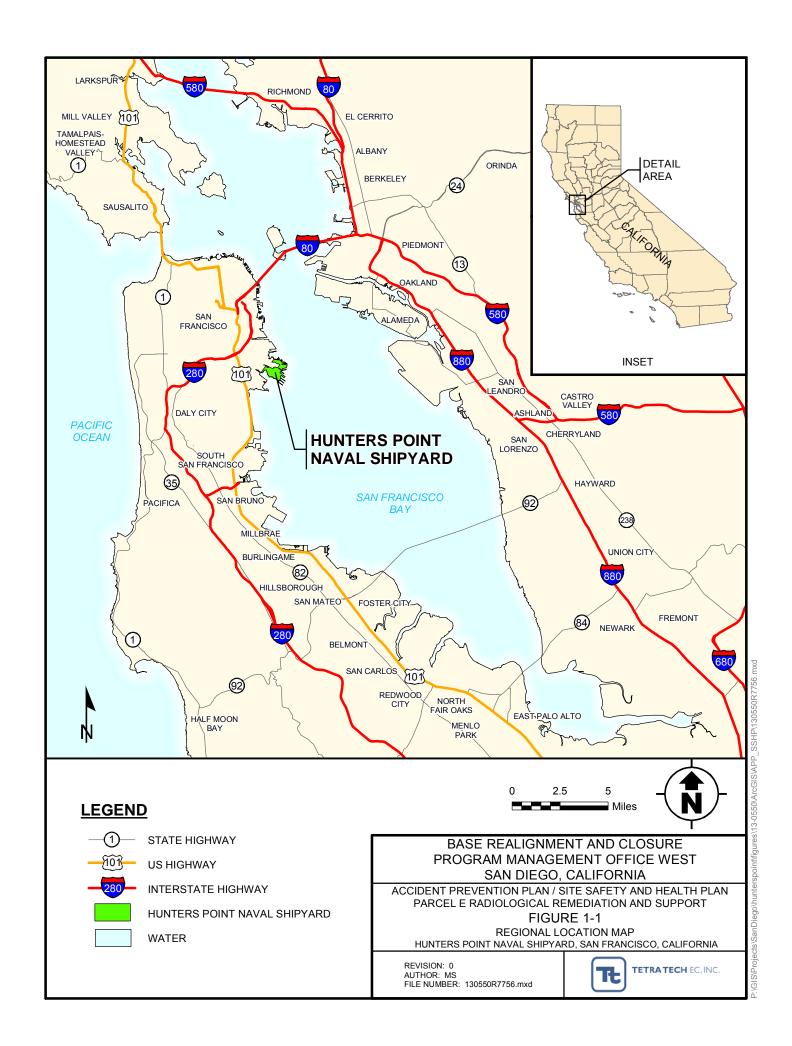
SFPD – San Francisco Police Department

SHM – Safety and Health Manager

SSHO - Site Safety and Health Officer

TtEC - Tetra Tech EC, Inc.

FIGURES



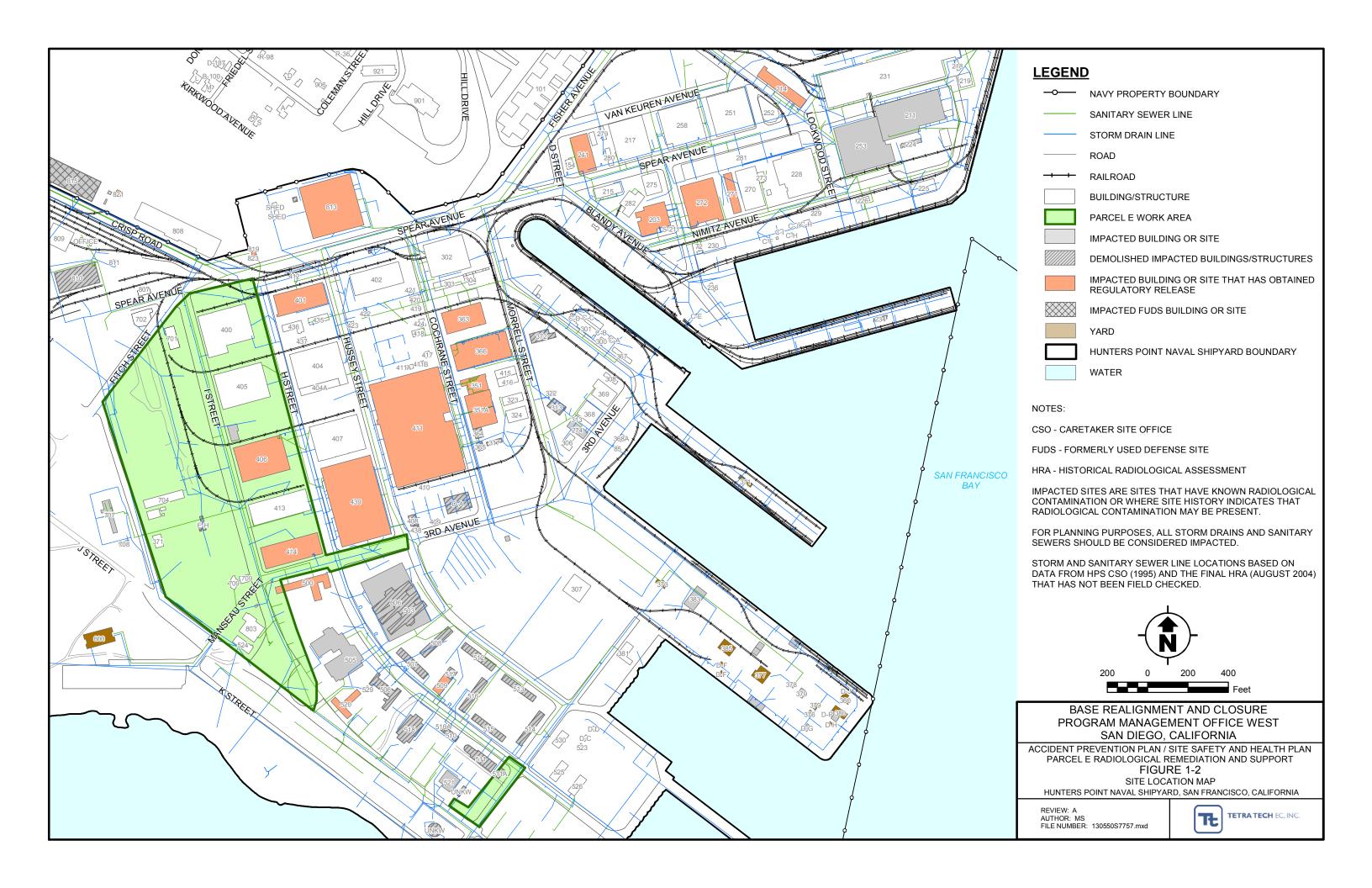
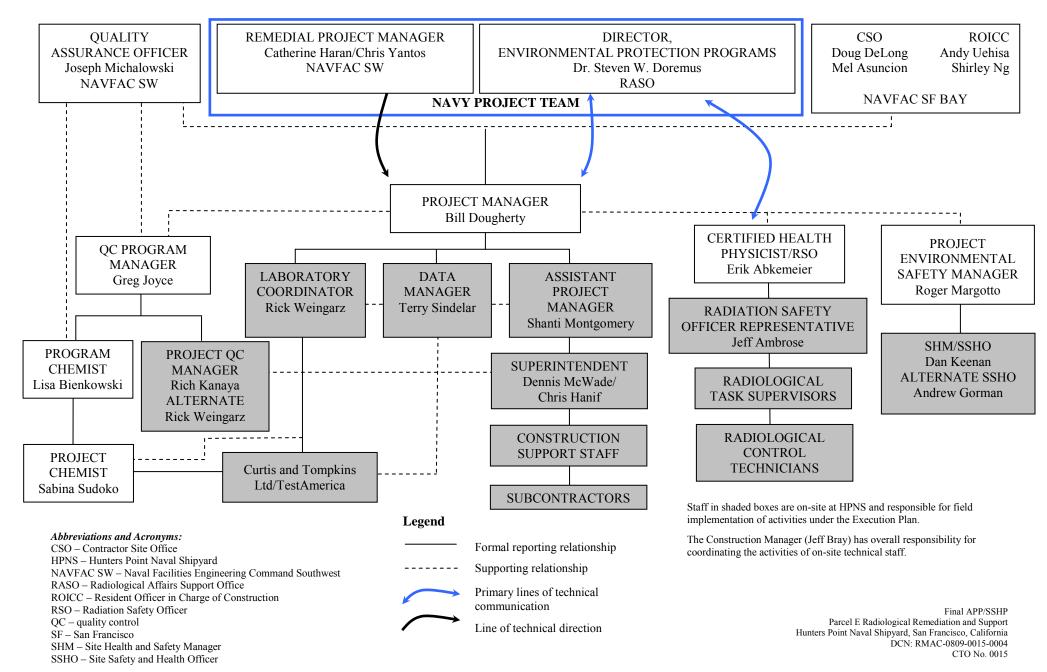


FIGURE 3-1
PROJECT ORGANIZATION CHART



EXHIBITS

Environmental Safety and Quality Policy











Tetra Tech EC, Inc. (TtEC) is committed to ensuring the health, safety, and well being of our employees and the communities in which we work, enhancing and protecting the environment, and providing quality services to our clients. Our Environmental, Safety and Quality (ESQ) Policy provides the framework and underlying principles for our Environmental Management System and is an integral part of

All TtEC associates have the right to work in a safe and healthful workplace as well as the responsibility to help create and work in a safe and environmentally protective manner:

- We will complete our work successfully, with a great deal of attention to health and safety by:

 - Incorporating pollution prevention and loss prevention principles into our work process.
 Employing well-trained personnel who understand and have the knowledge to fulfill their ESQ responsibilities.
- We will fully comply with all laws and regulations pertaining to our business, as well as, company policies and procedures
- We will commit ourselves to complying with the terms of our contracts and to meeting the four project objectives—knowing scope, budget, schedule, and level of quality.
- We will provide the level of quality our internal and external clients expect and pay for and use its attainment as our measure of success.
- We will safely and properly plan our work and work our plan.
- We will communicate and document the execution of our work.
- We will gather data and make decisions inclusively and involve employees and others affected by ESQ decisions inclusively.
- - Establishing and periodically updating ESQ improvement objectives and targets.
 - Recognizing outstanding employee and project ESQ performance.

These commitments are defined in, and are fundamental to, our Client Service Quality®, Do It Right[®], and Shared Vision[®], Zero Incident Performance[®] operating philosophies.



TETRA TECH EC, INC. CORPORATE HEALTH AND SAFETY PROGRAM PROCEDURES LIST

EHS 1-1	Responsibilities for Program Implementation
EHS 1-2	Awareness and Recoginition Program
EHS 1-3	Employee Participation Program
EHS 1-4	Subcontractor Selection and Management
EHS 1-5	Visitor Safety
EHS 1-7	Event Reporting and Investigation
EHS 1-9	Recordkeeping
EHS 1-10	External Regulatory Inspections and Notifications
EHS 1-11	Training
EHS 2-1	Emergency Preparedness
EHS 3-1	Ergonomics
EHS 3-2	$Procedures-Environmental\ Health\ and\ Safety\ Plan(s)$
EHS 3-3	EHS Inspections
EHS 3-4	Site and Contamination Control
EHS 3-5	Activity Hazard Analysis
EHS 3-6	Work Rules
EHS 3-7	Hazardous Material Storage and Transportation
EHS 3-8	Fall Protection
EHS 3-9	Hoisting and Rigging
EHS 3-10	Electrical Safety
EHS 3-11	Hand and Portable Power Tools
EHS 3-12	Scaffolding
EHS 3-13	Motorized Vehicles and Equipment
EHS 3-14	Fire Prevention
EHS 3-15	Underground Utilities
EHS 4-1	Bloodborne Pathogens
EHS 4-2	Hazard Communication
EHS 4-3	Radioactive and Mixed Waste Programs
EHS 4-4	Hearing Conservation
EHS 4-5	Medical Screening and Surveillance
EHS 4-6	Temperature Extremes

TETRA TECH EC, INC. CORPORATE HEALTH AND SAFETY PROGRAM PROCEDURES LIST

EHS 5-1	Personal Protective Equipment
EHS 5-2	Respiratory Protection
EHS 6-1	Confined Space Entry
EHS 6-2	Drill Rigs
EHS 6-3	Excavation and Trenching
EHS 6-4	Lockout/Tagout
EHS 6-5	Welding/Hot Work
EHS 6-6	Boating
EHS 6-7	Drum and Container Handling
EHS 6-8	Demolition
EHS 6-9	Line Breaking
EHS 7-1	UXO Initial Site Assessment
EHS 7-2	UXO Drilling Operations
EHS 7-3	UXO Quality Control
EHS 7-4	UXO Safety Concepts
EHS 7-5	UXO Demolition Safety Precautions
EHS 8-1	Asbestos Control



We value the safety and well being of all associates. We work on the premise that all accidents are preventable. Our goal of **Zero Incident Performance**® is supported by the integration of safety concepts, principles and practices into each work effort and project phase.





Zero Incident Performance® Pledge

As a member of the Tetra Tech EC, Inc. Team, I am dedicated to the goal of Zero Incident Performance:

- I believe that all incidents are preventable.
- I believe that Zero Incident Performance is achievable through proper planning, tasking, and execution of plans and procedures as written.
- I believe that the investigation of "near misses" provides an opportunity for improvement before a loss occurs.
- I will make every effort to understand how to properly perform each task that I am assigned.
- I will perform each task in a safe and environmentally protective manner with the appropriate level of quality.
- I will help to fix things that are wrong.
- I will immediately report all incidents including "near misses" to my supervisor.



APPENDIX A ACTIVITY HAZARD ANALYSES

Activity Hazard Analysis (AHA) #1

Job/Task: Mobilization and Site Setup	Overall Risk Assessment Code (RAC) (Use highest code)				M	
Project Location: Hunters Point Naval Shipyard, San Francisco, California	Risk Assessment Code (RAC) Matrix					
Contract Number: N62473-10-D-0809, CTO 0015	Savarity			Probability		
Date Prepared: August 21, 2013	Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Dan Keenan, SSHO	Catastrophic	E	E	Н	Н	M
Prepared by (Name/Title). Dan Reenan, SSHO	Critical	E	Н	Н	M	L
Daviawad hu (Nama/Titla), Dagar Margatta, CHI, CCD, Dragram CHI	Marginal	Н	M	M	L	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Negligible	M	L	L	L	L
	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (see above).				AC (see	
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must	"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely. RAC Chart					Chart
review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available	"Severity" is the outcome/degree if an incident, near miss, or E = Extremely High Risk					
on-site for review of specific materials and mitigation measures.	accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible. H = High Risk				sk	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L M = Moderate Risk				ite Risk	
	for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA. L = Low Risk				k	

AHA #1 – Job/Task: Mobilization and Site Setup						
Job Steps	Hazards	Controls	RAC			
1. Set up work areas.	Workers could be exposed to chemical hazards.	Delineate exclusion zones and use PPE as required by type of material being used. Refer to MSDSs/SDSs. Ambient air monitoring and visual observation will be used to verify selection of PPE. Identify all chemical hazards and receive training (MSDSs/SDSs) regarding safe handling of chemicals. The SSHO will file copies of all MSDSs/SDSs at the site.	M			

AHA #1 – Job/Task: Mobiliz	zation and Site Setup		
Job Steps	Hazards	Controls	RAC
1. Set up work areas. (Continued)	Noise could cause hearing loss.	Hearing protection is required when sound levels exceed 84 dBA continuously. Usually this will only be for workers working in unenclosed cabs of heavy equipment or ground workers working near heavy equipment.	
	Slip, trip, and fall hazards could be present.	Work areas will be visually inspected and slip, trip, and fall hazards marked, barricaded, or eliminated, when feasible. Work areas will be kept neat and orderly. Supplies and materials will be placed in areas away from normal foot traffic routes. Equipment and tools will always be placed in a safe location and will not present a trip hazard to nearby workers. Maintain proper illumination in all work areas. Work is authorized normally during daylight hours only. Refer to EHS Procedure 3-8, Fall Protection, when performing work at heights above 6 feet and written fall protection plan (see Section 8.23 of the APP).	
	Sharp objects could cause punctures.	Wear cut-resistant work gloves when sharp edges or other objects may cause the possibility of lacerations or other injury. When possible, sharp edges will be blunted. Workers should not stand or walk on equipment or supplies.	
	Strains from manually moving materials and equipment could occur.	Personnel will be directed to use proper lifting techniques such as keeping the back straight, lifting with legs, no twisting at waist (instead pivot with feet), and getting help when moving bulky/heavy materials and equipment. Use of hand truck will be encouraged. Employees will not lift more than 50 pounds alone. Obtain assistance from another worker or use a mechanical device when possible. Refer to EHS 3-1, Ergonomics.	
	Workers could be exposed to extreme temperatures.	Monitor for heat stress in accordance with EHS 4-6, Temperature Extremes. Provide fluids and rest breaks during warm weather and while wearing impermeable protective clothing.	
	Eye hazards could be present.	Safety glasses are the minimum required eye protection for all work areas.	
	Electrocution could occur from generator used for power tools.	Only qualified electricians are allowed to hook up or disconnect electrical circuits, using arc flash protection if working on live circuits. (Permit is required for live electrical work per EM 385-1-1). Follow lockout/tagout protocols. Inspect all extension cords daily for structural integrity, ground continuity, and damaged areas. Extension cord must be rated for hard or extra hard usage (Table 400-4, NEC). The SSHO will inspect electrical cords and connections daily. Use GFCIs on all outdoor 115- to 120-volt, 20-ampere or less circuits. Elevate or cover electric wire or flexible cord passing through work area to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching (cover only in accordance with NEC requirements).	

Job Steps	Hazards	Controls	RAC
1. Set up work areas. (Continued)		Keep plugs and receptacles out of water, unless they are approved, submersible types. Ground all electrical circuits in accordance with the National Electrical Code or other applicable standards and regulations. If a generator is used, be sure it is a type that does not require grounding. If it requires grounding, follow manufacturer's directions. National Electrical Code 250-6 lists the exceptions for grounding portable and vehicle-mounted generators.	
	Lack of communication in widely dispersed areas could lead to delayed response in an emergency.	Ensure that each work team has a telephone or access to a telephone for communication. In addition, workers must have a 2-way radio that can contact someone who has access to a phone if they are not in line of sight of other workers. If more than one team at a time is working, ensure that there is communication between the work teams and project management. Use the buddy system.	
	Workers could be struck by or against heavy equipment.	Wear high-visibility reflective vests when exposed to vehicle traffic. Make eye contact with operators before approaching equipment. Understand and review posted hand signals. Traffic barricades, signs, flags, and backup spotters will be used during field activities.	
	Biological hazards such as snakes, insects, ticks, or spiders could cause poisoning, disease.	Look carefully for animals before stepping into any area or before placing hands near the ground. If traversing through chaparral, use a walking stick to identify rattlesnakes. Watch for snakes when disturbing rubble or debris. Use insect repellant as necessary. Wear long sleeves when walking through thick brush.	
2. Set up air monitoring stations.	Inadequate coverage or improper placement of stations.	Use site background information, nearby sensitive areas, and predominant wind direction to choose sites for air monitoring stations. Avoid local airflow obstacles such as buildings or other structures. Place stations in upwind and downwind locations likely to pick up any airborne contaminants. Ease of safe access should be considered when siting monitors.	L
	Electrical shock.	Supply power using approved power supply lines. Temporary wiring may need to be installed by a qualified electrician. (Live electrical work requires arc flash protection and a permit as required by EM 385-1-1.) Electrical connections must be rated for outdoor use and should be protected from the elements.	
	Malfunction of equipment could delay identification of airborne contaminants.	Establish and follow a regular schedule for inspecting air monitoring equipment function. Collect samples routinely to keep equipment performing properly.	

AHA #1 – Job/Task: Mobilization and Site Setup				
Job Steps	Hazards	Controls	RAC	
3. Install barricades, fences, and other support structures.	Improper use of power and hand tools could cause injury or damage tools.	Inspect all tools before each use. Personnel will be trained in the proper use of hand tools. All power tools will be grounded, protected by GFCI, or double-insulated.	М	
	Material handling could cause injury.	Identify and avoid pinch points. Maintain communication with others involved in material handling. Use appropriate PPE.		
	Strains from handling materials could occur.	Personnel will be directed to use proper lifting techniques such as keeping the back straight, lifting with legs, no twisting at waist, and getting help when moving bulky/heavy materials and equipment. Use of hand trucks will be encouraged. Personnel will work at a steady pace. Refer to EHS 3-1, Ergonomics.		
Establish stormwater pollution protection measures.	Sediment into stormwater runoff can cause environmental damage.	Follow the SWPPP procedures for installing and maintaining applicable protective measures including straw wattles around stockpiles, filter fabric in storm drains, diversion ditches, settling ponds, etc.	L	
	Ergonomic injury could occur from incorrectly lifting SWPPP items.	Follow safe lifting guidelines, take part in the daily stretching routine, and use mechanical assistance wherever possible to aid in moving heavy items.		

AHA #1 – Job/Task: Mobilization and Site Setup				
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements		
PPE – minimum of hard hat, safety glasses, high- visibility vest, and hard-toe work boots	Personnel will be trained in the proper inspection, use, maintenance, and selection of PPE.	Inspect PPE daily and before use.		
Site vehicles	Drivers must have current state-issued driver's license.	Daily vehicle inspection by drivers. Receipt inspection by Project Superintendent.		
Heavy equipment	Operators will be qualified and experienced operators for use of the equipment they operate.	Receipt inspection by Project Superintendent. Daily inspection by operator.		
Hand and power tools	Training in use of hand and power tools by the SSHO or designee and review of operating manual. Use proper hand tool for the task.	Daily inspection by users/operators. Inspect tools and power cords to ensure they are listed by an NRTL. Inspect for damage to tool and to cords.		
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.		
First aid kits and other emergency equipment	Use of emergency equipment/first aid kits must be done by personnel familiar with this plan; use and inspection criteria of the equipment, and what the equipment is used for, are by or under direction of the SSHO.	Initially and at least weekly thereafter or after use for restocking. Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.		

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis

APP – Accident Prevention Plan

CIH – Certified Industrial Hygienist

CSP – Certified Safety Professional

CTO – Contract Task Order

dBA – decibels, A-scale

DMV – Department of Motor Vehicles

EHS – Environmental Health and Safety

EM – Engineer Manual

GFCI – ground fault circuit interrupter

MSDS – Material Safety Data Sheet

NEC – National Electric Code

NRTL – Nationally Recognized Testing Laboratory

PPE – personal protective equipment

RAC – Risk Assessment Code

SDS – Safety Data Sheet

SSHO – Site Safety and Health Officer

SSHP – Site Safety and Health Plan

SWPPP - Stormwater Pollution Prevention Plan

TtEC – Tetra Tech EC, Inc.

Activity Hazard Analysis (AHA) #2

Job/Task: Demolition, Removal, and Recycling of Concrete and Asphalt	Overall Risk Assessment Code (RAC) (Use highes		(Use highest	code)	М	
Project Location: Hunters Point Naval Shipyard, San Francisco, California	Risk Assessment Code (RAC) Matrix					
Contract Number: N62473-10-D-0809, CTO 0015	Severity			Probability		
Date Prepared: August 21, 2013	Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Drangrad by (Nama/Fitla), Dan Vagnan CSD SSHO	Catastrophic	E	E	Н	Н	M
Prepared by (Name/Title): Dan Keenan, CSP, SSHO	Critical	E	Н	Н	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	H	M	M	L	L
Reviewed by (Name/Title). Roger Margotto, Chr., CSr., Frogram Chr.	Negligible	M	L	L	L	L
	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (see above).					
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must	"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely. RAC Chart					Chart
review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available	"Severity" is the outcome/degree if an incident, near miss, or E = Extremely High Risk					
on-site for review of specific materials and mitigation measures.	accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible. H = High Risk				k	
	Step 2: Identify the RAC (Pro				I = Modera	ite Risk
	for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA. L = Low Risk				<u></u>	

AHA #2 – Job/Task: Demolition, Removal, and Recycling of Concrete and Asphalt				
Job Steps	Hazards	Controls	RAC	
Inspect area for utilities and clearance for heavy equipment.	Contact with underground utilities could cause injury to worker and damage to property or equipment.	Contact 811 – National One Call. Physically verify the location and depth of existing utilities prior to starting excavation through geophysical and utility survey. Protect all existing utilities during excavation. Perform excavation within 4 feet of existing utilities by hand and/or nonaggressive methods. Protect all underground utilities as soil is removed around or under the utility line, if excavation must be done around a utility line.	М	

A	AHA #2 – Job/Task: Demolition, Removal, and Recycling of Concrete and Asphalt				
	Job Steps	Hazards	Controls	RAC	
1.	Inspect area for utilities and clearance for heavy equipment. (Continued)	Contact with overhead utilities could cause injury to worker and damage to property or equipment.	Ensure that area has been surveyed and that boom of heavy equipment will not contact overhead lines (15-foot clearance minimum required). If power lines are over the work area, the voltage must be known to verify that clearance is adequate.		
2.	Mobilize heavy equipment to site.	Failure to inspect equipment could contribute to equipment failure, causing damage or injury. Weight of equipment could cause collapse of underground structures due to weight of unit.	Ensure that inspection has been performed according to the manufacturer's instructions as well as EM 385-1-1 and the SSHP. Inspect travel route to ensure that ground can support weight of the equipment. Pay particular attention to system hydraulics.	M	
3.	Demolish concrete or asphalt either by lifting it up in pieces or by use of a breaker attachment.	Employees could be struck by concrete as it is being broken up.	All employees must wear high-visibility shirts or vests. All ground workers must maintain eye contact with operator of equipment. Use proper PPE. Equipment cab should be protected with a debris screen over front windows.	M	
		Breaker attachment could be improperly installed and inadvertently fall off or cause injury or damage.	Ensure that the breaker attachment is the equipment manufacturer-approved attachment. Ensure that all retention pins are properly seated and engaged and that all hydraulic hoses are connected properly. Never stand beneath elevated equipment.		
		Employees could be exposed to concrete dust. Concrete dust may contain silica.	Use dust control methods such as spraying area with a fine mist of water. Wear respirator if dust levels exceed 0.05 mg/m ³ . Follow the requirements of the Basewide Dust Control Plan.		
		Noise from heavy equipment usage could cause hearing loss.	Hearing protection is required when sound levels exceed 84 dBA continuously. Usually this will only be for workers working in unenclosed cabs of heavy equipment or ground workers working near heavy equipment breaking concrete.		
4.	Collect and size debris for disposition.	Debris could snag on clothing or equipment or cause cuts and abrasions to workers. Rebar could cut and puncture.	Wear leather work gloves while handling debris. Avoid contact with debris by avoiding entangled debris and keeping as much distance as possible from the debris. Do not manually lift debris that is more than 50 pounds. Avoid protruding rebar. Never work above protruding rebar. Bend or cut/blunt protruding rebar or use rebar caps.	M	
		Rebar or concrete could become airborne while moving.	Be aware of long pieces of rebar when moving material. Use caution when using shear or thumb attachment on excavator.		
5.	Haul debris off-site or place in stockpile.	Truckers and ground workers could be struck by load as it is loaded.	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector (FOPS). Load trucks so that dust generation is minimal by dropping the load as close as possible to the top of the truck. Use dust-control measures.	M	

AI	AHA #2 – Job/Task: Demolition, Removal, and Recycling of Concrete and Asphalt				
	Job Steps	Hazards	Controls	RAC	
5.	Haul debris off-site or place in stockpile. (Continued)	Trucks to enter streets and highway with loads could get dust and debris on roads.	Brush off trucks before they enter a paved road. Tarp truck or load truck in such a manner to prevent dirt and dust from getting onto paved roads. Ensure that debris will not come off truck as the material is transported.		
6.	Crushing concrete/asphalt for recycling	Uneven walking surfaces	Maintain good housekeeping to minimize trip hazards.	M	
		Falling/Flying debris	Wear hard hat and safety glasses at all times. Do not walk under equipment/materials.		
		Dust – concrete dust can be high in respirable silica quartz.	Apply water as dust suppressant as needed to control dust release. Wear N-100 respirators if dust cannot be controlled. If dust levels exceed 0.5 mg/m ³ and dust cannot be controlled, workers will wear full-face respirator with P-100 cartridges. Follow the requirements of the Basewide Dust Control Plan.		
		Noise	Use hearing protection when noise levels exceed 84 dBA.		
		Pulleys/Conveyors	Guards, emergency shut off switches, and operation indicators shall be installed as per manufacturer, OSHA, and EM 385-1-1 (Section 17) requirements. There must be an emergency stop device along the entire length of the conveyor. There must be audio and visual alarms prior to the startup of the conveyor. Only experienced and qualified personnel shall operate.	L	
		Hopper/Conveyor maintenance	All equipment is inspected every day before use. Damage will be reported and all needed repairs will be made before any equipment is returned to service. Competent person will inspect all rigging before use. Any damaged slings will be tagged DO NOT USE and replaced. Pad any sharp edges before attaching slings. Use a Lockout/Tagout system with permit to control any energy, prevent inadvertent startup, or cause injury while maintenance is being conducted.	M	

AHA #2 – Job/Task: Demolition, Removal, and Recycling of Concrete and Asphalt					
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements			
Vehicles, pickup trucks	Only licensed personnel will operate vehicles.	Daily and before use. Use equipment safety checklist.			
Heavy equipment (backhoe, excavator, dump trucks, excavator with breaker attachment, conveyors)	Only qualified persons may operate equipment. Operators' manual must be reviewed and be available on-site.	Daily and before use. Use inspection checklists.			
Equipment, hand tools	Specific training for power tools and hand tools will be provided.	Inspect all equipment and tools before each use. Inspect hand tools before each use following manufacturers' requirements. Discard or tag out-of-service any tools that are damaged. Do not use power tools that have frayed cords or exposed wiring. All power tools must have a grounding plug or be double-insulated. The SSHO will inspect electrical cords and connections daily.			
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.			
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first- aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1, and Cal-OSHA (8 CCR 5812). Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.			

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis

APP – Accident Prevention Plan

Cal-OSHA - California Occupational Safety and Health Administration

CCR – California Code of Regulations

CFR – Code of Federal Regulations

CIH – Certified Industrial Hygienist

CSP – Certified Safety Professional

CTO – Contract Task Order

dBA – decibels, A-scale

EM – Engineer Manual

FOPS – falling object protective structure

mg/m³ – milligrams per cubic meter

OSHA - Occupation Safety and Health Administration

PPE – personal protective equipment

RAC – Risk Assessment Code

SSHO – Site Safety and Health Officer

SSHP – Site Safety and Health Plan

TtEC - Tetra Tech EC, Inc.

Job/Task: Excavation of Soil, Pipe Removal, Backfilling, and Hauling	Overall Risk Assessment Code (RAC) (Use highest code)			М		
Project Location: Hunters Point Naval Shipyard, San Francisco, California	Risk	x Assessmer	nt Code (R	RAC) Matrix	K	
Contract Number: N62473-10-D-0809, CTO 0015	Severity			Probability		
Date Prepared: August 21, 2013	Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Propored by (Nama/Titla): Don Vacanon SSHO	Catastrophic	E	E	Н	Н	M
Prepared by (Name/Title): Dan Keenan, SSHO	Critical	E	Н	Н	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	H	M	M	L	L
Reviewed by (Name/Title). Roger Margotto, CIT, CSF, Frogram CIT	Negligible	M	L	L	L	L
	Step 1: Review each "Hazard above).	l" with identifi	ied safety "C	Controls" and c	letermine RA	.C (see
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must	"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely. RAC Chart					Chart
review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available	"Severity" is the outcome/degree if an incident, near miss, or E = Extremely High Risk					
on-site for review of specific materials and mitigation measures.	accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible. H = High Risk				k	
	Step 2: Identify the RAC (Profor each "Hazard" on the AHA				1 = Modera	te Risk
	for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA. $L = Lov$		L = Low Risk			

AHA #3 – Job/Task: Excavation of Soil, Pipe Removal, Backfilling, and Hauling							
Job Steps	Hazards	Controls	RAC				
1. Excavate.	Contact with underground utilities could cause injury to worker and damage to property or equipment.	Physically verify the location and depth of existing utilities prior to starting excavation through geophysical and utility survey. Call National One Call, 811, prior to any disturbance of ground. Scan the excavation area with electromagnetic and sonic equipment and mark ground where existing underground utilities are discovered. Protect all existing utilities during excavation. Perform excavation within 4 feet of existing utilities by hand	M				

Job Steps	Hazards	Controls	RAC
1. Excavate. (Continued)		and/or nonaggressive methods per EHS 3-15, Underground Utilities. (Cal-OSHA requires an 18-inch buffer zone on each side of existing utility lines.) Protect all underground utilities as soil is removed around or under the utility line. Complete and submit activity notification form for Cal-OSHA if any personnel are planning to enter excavation that is 5 feet or greater in depth. (Must have a state excavation permit posted.) Notify the PESM as the SSHP and APP must be modified for trench entry.	
	Workers could be struck by or against heavy equipment.	Wear high-visibility safety vests when exposed to vehicular traffic. Avoid equipment swing areas. Make eye contact with operators before approaching equipment. Understand and review posted hand signals. Workers must always be in visual sight of the operators. Use trained spotters.	
	Workers could be exposed to chemical contaminants or potential gases, such as natural gas from a leaking gas line.	Conduct air monitoring for contaminants as excavation activities proceed according to the SSHP. If odors are detected, immediately check for the presence of potentially explosive gas concentrations. Wear Level D PPE or upgrade, as required.	
	Excavation hazards, such as collapsed sides, equipment tipping over, flooding, falling, or dust generation, could be present.	Follow EHS 6-3, Excavation and Trenching. Ensure proper shoring or sloping. Spoil banks and equipment must be at least 2 feet away from the excavation. Use diversion ditches, dikes, or other means to prevent surface water from entering an excavation and to provide good drainage of the area adjacent to the excavation. Daily inspections of excavation, the adjacent areas, and protective systems shall be made by the project assigned competent person (Dennis McWade). The excavation/trenching permit must also be completed by the competent person each day. Maintain eye contact with operators. Personnel must wear high-visibility safety vests. Avoid climbing on berms and any temporary stockpiles. Barricade all open excavations as required by the Work Plan. Handle soil carefully to avoid dust generation. Follow the requirements of the Basewide Dust Control Plan. No excavation can be 20 feet or greater in depth unless there is an approved engineering plan for an excavation that is 20 feet or greater in depth. The plan must be signed by a registered professional engineer. An FCR must be submitted to modify the AHA for work at 20 feet or greater in depth.	
	Strains from use of tools, such as shovels, could occur.	Maintain steady pace when using tools and take adequate rest periods. If possible, rotate tasks among the workers. Use appropriate tools for the task and maintain tools in good condition.	

AHA #3 – Job/Task: Exca	vation of Soil, Pipe Removal, Backfilling	g, and Hauling	
Job Steps	Hazards	Controls	RAC
1. Excavate. (Continued)	Heavy equipment hazards could be present.	Equip all heavy equipment on this project with rollover protection systems and backup alarms. Stay clear of moving equipment, unless necessary. If working near equipment, workers must be in visual contact with the operator. Inspect all equipment daily, before use, to ensure that proper maintenance is being performed. Make eye contact with operator; heavy equipment has right-ofway. Workers will not work under any equipment or loads.	
	Workers could fall into excavation.	As required by EM 385-1-1 and EHS 3-8, Fall Protection, if the excavation is 6 feet or greater in depth, workers must be at least 6 feet from the edge of the excavation. If workers must be closer, they must use personal fall protection (full body harness, lanyard or retractable life line, anchorage point) and follow the written fall protection plan (see Section 8.23 of the APP). If excavation is less than 6 feet deep, workers should stand at least 2 feet from the edge of the excavation.	
2. Remove pipes.	Pipes could release hazardous materials or biological waste.	Avoid contact with materials. Wear PPE as specified in APP/SSHP.	M
	Pipes could swing out and drop as they are being removed.	Avoid area as pipes are being raised and lowered. Barricade or use spotters to segregate work area.	
3. Survey pipes for radiation.	Pipes could have hazardous materials or biological waste on the outside and inside.	Avoid contact with materials. Wear PPE as specified in APP/SSHP.	L
	Pipes could be too close to the edge of the excavation and surveyor could fall into excavation.	If excavation is 6 feet or greater in depth, the pipes must be placed at least 8 feet from the excavation (this allows the surveyor a 2-foot clearance on the side closest to excavation). If this cannot be done, the surveyor and all other people on the ground must use personal fall protection (full body harness, lanyard or retractable life line, anchorage point) and follow the written fall protection plan (see Section 8.23 of the APP).	
4. Backfill.	Workers could be struck by or against heavy equipment or trucks.	Wear high-visibility safety vests. Avoid equipment swing areas. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals.	M
	Damage to utilities could occur.	Ensure that utilities are protected from the fill material as it is being placed. Be sure that fill material does not contain rocks or objects that could damage the utilities. Follow the Work Plan for proper placement and compaction of backfill.	

Al	AHA #3 – Job/Task: Excavation of Soil, Pipe Removal, Backfilling, and Hauling					
	Job Steps	Hazards	Controls	RAC		
4.	Backfill. (Continued)	Haul trucks could enter excavation.	Use spotters to ensure haul trucks maintain safe distance from excavation edge. Regularly monitor integrity of excavation sides.			
5.	Haul material from the excavation and haul backfill to the excavation.	Workers could be struck by or against heavy equipment or trucks.	Establish and follow the Traffic Control Plan provided in Section 4.0 of the Execution Plan. Wear reflective warning vests. Avoid equipment swing areas and designated traffic routes. Make eye contact with operators before approaching equipment or trucks. Understand and review posted hand signals. Use spotters and flaggers as necessary to direct trucks and any nearby traffic.	M		
		Truckers and ground workers could be struck by load as it is loaded.	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector (FOPS).			
		Dirt and other materials can be accumulated on roads used for transport of material.	Brush off trucks before they enter a paved road. Tarp truck or load truck in such a manner to prevent dirt and dust from getting onto paved roads. Ensure that debris will not come off truck as the material is transported.			

AHA #3 – Job/Task: Excavation of Soil, Pipe Removal, Backfilling, and Hauling					
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements			
Heavy equipment (excavators, loaders, dozers, backhoes), dump trucks	Only qualified persons may operate equipment. Operators' manual must be reviewed and be available on-site. Only DMV-licensed personnel will operate trucks. Excavation competent person must be on-site during excavation activities (Dennis McWade).	Daily and before use. Use inspection checklists. Excavation competent person must be on-site during excavation activities.			
Radiation survey instruments, PID, multi-gas meter, respirable aerosol monitor.	Only qualified persons may use the instruments. Personnel will follow the users' manuals regarding use and calibration.	Daily and before use. Document calibration of instruments in a logbook or a calibration form used for the instrument. Ensure that instruments requiring manufacturer recalibration or calibration by a service company are calibrated according the frequency of calibration specified by the manufacturer.			

AHA #3 – Job/Task: Excavation of Soil, Pipe Removal, Backfilling, and Hauling						
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.				
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first- aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1 and Cal-OSHA (8 CCR 5812). Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.				

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis

APP – Accident Prevention Plan

Cal-OSHA – California Occupational Safety and Health Administration

CCR – California Code of Regulations

CFR – Code of Federal Regulations

CIH – Certified Industrial Hygienist

CSP – Certified Safety Professional

CTO – Contract Task Order

DMV – Department of Motor Vehicles

EHS – Environmental Health and Safety

EM – Engineer Manual

FCR - Field Change Request

FOPS – falling object protective structure

PESM – Project Environmental Safety Manager

PID – photoionization detector

PPE – personal protective equipment

RAC – Risk Assessment Code

SSHO – Site Safety and Health Officer

SSHP – Site Safety and Health Plan

TtEC – Tetra Tech EC, Inc.

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Job/Task: Radiological Surface Surveillance	Overall Risk Asses	Overall Risk Assessment Code (RAC) (Use highest code)				M
Project Location: Hunters Point Naval Shipyard, San Francisco, California	Risk Assessment Code (RAC) Matrix					
Contract Number: N62473-10-D-0809, CTO 0015	Severity			Probability		
Date Prepared: August 22, 2013	Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Dan Keenan, CSP, SSHO	Catastrophic	E	E	Н	Н	M
rrepared by (Name/True). Dan Reenan, CSF, SSHO	Critical	E	Н	Н	M	L
Daviewed by (Neme/Title): Degar Margette CHI CSD Dragram CHI	Marginal	Н	M	M	L	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Negligible	M	L	L	L	L
	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (see above).					
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must	"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely. RAC Chart					Chart
review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available	"Severity" is the outcome/degree if an incident, near miss, or E = Extremely High Risk					ly High Risk
on-site for review of specific materials and mitigation measures.	accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible. H = High Risk					k
					M = Moderate Risk	
	for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA. L = Low R		L = Low Risl	<u> </u>		

AHA #4 – Job/Task: Radiological Surface Surveillance						
Job Steps	Hazards	Controls	RAC			
Unload equipment from vehicle.	Lifting instruments from the vehicle could cause strain to worker.	Use proper lifting techniques such as keeping the back straight, lifting with legs, avoid twisting at waist, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift.	L			
2. Move survey equipment.	Handling of instruments could cause strain to worker.	Carry instruments as required by manufacturers of instruments. Use straps when provided and adjust for comfort. Use care when walking so that there are	L			

Al	HA #4 – Job/Task: Radiolo	ogical Surface Surveillance		
	Job Steps	Hazards	Controls	RAC
2.	Move survey equipment. (Continued)		no sudden jerks or missteps that can cause a worker to strain to maintain control of instrument. Get assistance from other workers if several instruments must be carried. For loads greater than 50 pounds, use two people to carry.	
3.			Use trained spotters to guide the truck driver to the proper position. Ground workers must always have direct eye contact with the truck operator.	L
		Trucks improperly loaded could cause loss of material or truck to handle unsafely or tip over.	Always load trucks from sides. Never overload a truck. Ensure load is evenly placed in dump.	
		Trucks could drive fast and generate dust or lose dust from the excavated soil inside the dump. While loading truck, dust could be generated.	Drive no faster than 15 miles per hour. Use dust suppression techniques such as fine water mist. Follow the requirements of the Basewide Dust Control Plan.	
4.	Dump soil and spread as required by the RWP.	While dumping load, dust could be generated.	Use dust suppression techniques such as fine water mist. Dump load slowly and as close to the ground as possible.	L
		Trucks could strike workers or other objects causing injury or damage. Load may not be placed where it is required to be positioned.	Use trained spotters to guide the truck driver to the proper position. Ground workers must always have direct eye contact with the truck operator.	
5.	Scan removed soil in the radiological storage yard as specified in the RWP.	Slip, trip, and fall hazards could be present.	Visually inspect work areas and mark, barricade, or eliminate slip, trip, and fall hazards. Only walk on surfaces that have the strength and integrity to support employees safely. Avoid walking on riprap or other uneven surfaces, if possible.	L
		Workers could be exposed to chemical or radiological contaminants.	Avoid generating dust. For potential radioactivity exposure, wear PPE as specified in the RWP and the SSHP. For potential chemical exposure, wear a minimum of Tyvek® coveralls, steel-toe boots with covers, nitrile gloves, safety glasses, and hard hat. Remove PPE properly and wash hands after use.	
6.	Use towed array to scan spread out soil.	Worker could be injured by the trailer hitch while connecting the towed array to the tractor or mule.	Use assistance from another worker when connecting the hitch. Ensure that workers do not place hands between the hitch and the connector. Wear leather work gloves to protect hands.	M
7.	Use elevating work platform (EWP) to survey soil left in excavation after pipes are removed.	EWP could tip over if too close to excavation. Workers could fall out of EWP if they fail to wear a full-body harness.	All workers operating the EWP must be trained on the use of the EWP. Training must be documented in the file. When in the basket of the EWP, workers must wear a personal fall arrest system consisting of full-body harness and lanyard.	M

AHA #4 – Job/Task: Radiole	ogical Surface Surveillance		
Job Steps	Hazards	Controls	RAC
7. Use EWP to survey soil left in excavation after pipes are removed. (Continued)	Workers getting on or off the EWP could be too close to the edge of the excavation and fall into the excavation.	Workers must attach the lanyard to the designated anchorage point in the basket. Workers should get on and off the EWP at least 6 feet from the edge of the excavation. The fall protection/excavation competent person will evaluate site conditions to ensure safe placement of the EWP. Workers must receive training on the fall protection plan (see Section 8.23 of the APP).	
	EWP could tip over when being driven over uneven surfaces. Workers could be thrown out of the EWP.	Ensure the path of travel has been inspected for ruts and debris. When moving the EWP, it is best if it is not extended and if the lift platform is over the main body of the equipment. Workers must wear a personal fall arrest system consisting of a full-body harness and lanyard. They must attach the lanyard to the designated anchorage point in the basket.	
	Workers could fall out of the EWP if they lean over the sides or climb the guardrails of the lift platform.	Workers will not lean over any guardrail. Workers will not climb guardrails or use any object in the EWP cage to climb to a higher height. Climbing on ladders, foot stools, buckets, etc., is not permitted.	
	EWP could tip over if there is too much weight on the lift platform, or if weight is not evenly distributed. Lift could tip over if objects are lifted or carried outside the lift platform cage.	Ensure that the weight limits of the platform are not exceeded. Never carry any objects outside the cage. Do not use the lift to lift objects to higher levels unless the entire object is inside the cage, the weight is evenly distributed, and the combined weight of personnel and the object does not exceed the weight limitations of the EWP.	
8. Mark suspected radioactive material, if necessary.	Use of spray paint to mark suspected radioactive material could expose worker to paint or fumes.	Follow manufacturers' instructions on use of paint. Review MSDS/SDSs. Never point spray paint canisters at another person.	L
	When carrying flags or stakes, worker could trip and impale body.	Carry flags or stakes in a leather or canvas bag that is puncture-proof and carry bag to side of body. Ensure that all tips are pointed toward ground at all times.	
	Installation of wooden stakes presents puncture and splinter hazards.	Keep stake tip pointed at the ground. Wear leather gloves. Use caution when using tools to pound in stakes.	

AHA #4 – Job/Task: Radiological Surface Surveillance					
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements			
Radiological survey instruments	Survey instruments must be calibrated and checked.	Daily or before use.			
Mule or small tractor, towed array	Operator must receive training or have had experience using the vehicle. Operator must review operator's manual, which must be available on-site.	Inspect the vehicle as required by the operator's manual. Inspect the towed array, especially all connections and the frame, daily before use.			

AHA #4 – Job/Task: Radiolo	AHA #4 – Job/Task: Radiological Surface Surveillance						
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements					
EWP (elevating work platform)	Follow manufacturer's operating manual for daily inspection. Ensure that all operators and users are trained in the requirements for use and the safety precautions specified by the manufacturer.	Upon delivery to site, daily before use.					
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.					
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first-aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1, and Cal-OSHA (8 CCR 5812). Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.					

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis

APP – Accident Prevention Plan

Cal-OSHA - California Occupational Safety and Health Administration

CCR – California Code of Regulations

CFR – Code of Federal Regulations

CIH – Certified Industrial Hygienist

CSP – Certified Safety Professional

CTO – Contract Task Order

EM – Engineer Manual

EWP – elevating work platform

MSDS – Material Safety Data Sheet

PPE – personal protective equipment

RAC – Risk Assessment Code

RWP – radiological work plan

SDS – Safety Data Sheet

SSHO – Site Safety and Health Officer

SSHP – Site Safety and Health Plan

TtEC – Tetra Tech EC, Inc.

Job/Task: Asphalt and Concrete Paving	Overall Risk Asses	ssment Code	e (RAC)	(Use highest	code)	M	
Project Location: Hunters Point Naval Shipyard, San Francisco, California	Risk Assessment Code (RAC) Matrix						
Contract Number: N62473-10-D-0809, CTO 0015	Severity			Probability			
Date Prepared: August 21, 2013	Severity	Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name/Title): Dan Keenan, SSHO	Catastrophic	E	E	Н	Н	M	
Prepared by (Name/Title). Dan Reenan, SSHO	Critical	E	Н	Н	M	L	
Daviewed by (Nema/Title): Decar Margette CHI CCD Program CHI	Marginal	Н	M	M	L	L	
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Negligible	M	L	L	L	L	
	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (see above).						
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must	"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely. RAC C					Chart	
review and be familiar with all provisions of the approved APP/SSHP. TtEC Corporate Safety Programs and the EM 385-1-1 will also be available	"Severity" is the outcome/degree if an incident, near miss, or E = Extremely High Risk					ly High Risk	
on-site for review of specific materials and mitigation measures.	accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible. H = High Risk					k	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L				M = Moderate Risk		
	for each "Hazard" on the AHA. Annotate the overall highest RAC at the top of the AHA.				L = Low Risl	ζ.	

AHA #5 – Job/Task: Asphalt and Concrete Paving					
Job Steps	Hazards	Controls	RAC		
Use heavy equipment; dump trucks and paving equipment working in area.	Workers could be struck by or against heavy equipment.	Wear high-visibility reflective vests. Make eye contact with operators before approaching equipment. Understand and review hand signals. Stay clear of moving equipment unless necessary. Identify and avoid pinch points.	M		
	Defective equipment could cause injury to workers or damage to other equipment.	Inspect all equipment when it arrives on-site. All equipment must be certified as operable by a competent mechanic. Any equipment that does not pass inspection must not be used.			

_	Job Steps	Hazards	Controls	RAC
1.	Use heavy equipment; dump trucks and paving equipment working in area. (Continued)	Noise could cause hearing loss.	Hearing protection is required when sound levels exceed 84 dBA continuously. Usually this will only be for workers working in unenclosed cabs of heavy equipment or ground workers working near heavy equipment.	
		Equipment could strike trees and other objects located nearby, such as fences and buildings.	Operators must drive carefully. Any time equipment is backed up, the driver will either use a spotter, or the driver must visually clear the area before backing up.	
		Traffic in area could be affected by work.	Follow the Traffic Control Plan. Obtain clearances for any traffic diversion, control, or closure.	
2.	Handle material.	Strains, sprains, other injury could occur.	Use proper lifting techniques such as keeping back straight, lifting with legs, avoiding twisting, and getting help when moving bulky/heavy materials and equipment weighing more than 50 pounds. Maintain communication with others involved in material handling.	L
		Unloaded material could fall on workers and injure them.	Workers will stand back from any load that is being unloaded.	
		Working with hand tools such as shovels and rakes could injure workers.	Inspect all tools before each use. Remove defective tools from service. Handle tools properly. Avoid repetitive motions for an extended period of time by rotating tasks among the workers.	
		Contact could occur with hot equipment such as burners, hoppers, etc.	Avoid touching hot parts of equipment. Wear protective gloves.	
3.	Work with hot asphalt.	Contact with hot asphalt could occur.	 Wear proper personal protective equipment (head, ear, eye, foot, and hand protection). The National Asphalt Pavement Association recommends: Chemical goggles and an 8-inch minimum-size face shield. Loose clothing in good condition with collars closed and cuffs buttoned at the wrist. Glove gauntlets that extend up the arm worn loosely so that they can be easily flipped off if covered with hot asphalt. Boots with tops at least 6 inches high and laced without openings through which asphalt could reach skin. Cuffless pants that extend over tops of boots. 	M

Job Steps	Hazards	Controls	RAC
3. Work with hot asphalt. (Continued)		Long-handled sprayers with flexible hoses should be used when emulsified asphalts are applied by hand for tack coats, or when cutback asphalt is applied by hand for prime coats. Remove asphalt immediately after skin contact. Avoid inhaling asphalt fumes. MSDSs/SDSs must be available for the asphalt and all other materials used, such as asphalt cutback, emulsifiers, and solvents. All workers must be trained on the MSDSs/SDSs.	
	Asphalt vapors are combustible when heated; cutbacks and emulsifiers may be flammable.	Use a fire protection program that includes the following elements developed by the National Asphalt Pavement Association: 1. Prohibit smoking except in designated areas.	
		2. Keep asphalt distributors clean and free from asphalt accumulations. Before spraying, shut off burners.	
		3. Keep exterior parts of distributor truck exhaust system clean to remove debris that could ignite and fall in path of the spray bar.4. Be prepared to shut off the distributor spray bar.	
		5. Make sure at least two dry chemical minimum 6A:80BC fire extinguishers are available in the vicinity (within 50 feet).	
	Elevated temperature could cause physical hazards.	Monitor ambient temperature to ensure that employees drink plenty of fluids and use work/rest cycles to avoid heat exhaustion. Monitor for heat stress as described in EHS 4-6 (pulse, body temperature).	
4. Construct forms (if needed) for pouring concrete when repaying.	If wood or metal is used for forms, workers could receive splinters from wood or cut their hands on metal.	Inspect wood or metal for splinters, burrs, or sharp points. Handle forms with leather work gloves.	L
5. Use power tools to cut wood.	Tool could be defective and injure worker. Improperly installed blades can shatter and injure worker. Electrocution. Untrained workers could injure themselves.	Ensure power tools are inspected before use. Check the power cord for frays, splices, and cuts. Inspect blades for sharpness and condition. Ensure connection is to a GFCI-protected circuit. Ensure that connection is tight. Ensure cord is not placed in wet environment. Test the tool before use by turning it on before cutting any wood. Do not use defective tools. Ensure that operator has been trained to operate tools. Wear protective eyewear. Do not wear gloves around rotating equipment or tools.	M

AHA #5 – Job/Task: Asphal	It and Concrete Paving		
Job Steps	Hazards	Controls	RAC
6. Install forms (if needed).	Usually a hammer or sledge hammer is used for installing. Use of hammer could injure nearby workers or present muscle strain to the worker.	Ensure that area near the hammer user is clear of nearby workers so that workers are not hit by the hammer. All workers will wear proper PPE. Rotate tasks among workers, so that no one worker will have a strain as the result of a repetitive task.	L
7. Set up concrete truck at site, if used.	Defective truck or equipment could cause potential injury to workers.	Inspect truck and ensure that it is ready for pouring. Check engine oil, hydraulic oil, and radiator water before starting engine. Inspect all safety covers, instruments, gauges, grates, tires, outriggers, etc., for safety and proper operation. Verify that proper clean-out equipment is available.	M
	Noise could cause hearing loss.	Hearing protection is required when sound levels exceed 84 dBA continuously. Usually this will only be for workers working in unenclosed cabs of heavy equipment or ground workers working near heavy equipment.	
	Truck may not be positioned safely on flat ground or stable soil, causing truck to roll or tilt.	Always be sure that the path of the truck, and the ground that it is positioned on, can accept the weight of a loaded truck. If the truck must be positioned at a slight angle, be sure to place chocks under the wheels to prevent additional movement of the truck.	
	Failure to communicate directions could result in error or injuries.	Only one person is to give directions to the operator.	
	Exposure to cement materials can cause skin irritation.	Avoid direct contact with cement. Obtain and review MSDS/SDS for cement and controlled density fill. Wear protective clothing (coveralls, neoprene or nitrile gloves, rubber or neoprene overboots, safety glasses, and face shield) when handling cement.	
	Workers could be struck by the delivery chute during a pour.	It is important that workers know the path of the truck. Workers must maintain clearance from the chute. The worker directing the pour must always be in communication and line of sight of the truck operator.	
	Traffic and pedestrians in area.	Ensure that area is cleared of pedestrians. Use signs, barricades, and flag persons to direct traffic away from activity.	

AHA #5 – Job/Task: Asphalt and Conc	rete Paving	
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements
Flagging materials	Provide flagger training (required by Cal-OSHA 8 CCR 1599).	Ensure that materials comply with Traffic Control Plan specifications. Inspect signage regularly.
Trucks, pavers, rollers	Provide specific training for equipment used. Operators' manuals must be available. Only qualified operators may operate the equipment.	Daily and before use. Upon arrival at the site, all equipment must be inspected and certified by a competent mechanic by using the safety inspection checklist.
Power tools and hand tools	Must be qualified to use or operate. Ensure users' manuals have been reviewed.	Inspect before each use. The SSHO will inspect electrical cords and connections daily.
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first-aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1, and Cal-OSHA (8 CCR 5812). Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis

APP – Accident Prevention Plan

Cal-OSHA - California Occupational Safety and Health Administration

CCR – California Code of Regulations

CFR – Code of Federal Regulations

CIH – Certified Industrial Hygienist

CSP – Certified Safety Professional

dBA – decibels, A-scale

EHS – Environmental Health and Safety

EM – Engineer Manual

GFCI – ground fault circuit interrupter

MSDS – Material Safety Data Sheet

PPE – personal protective equipment

RAC – Risk Assessment Code

SDS – Safety Data Sheet

SSHO – Site Safety and Health Officer

SSHP – Site Safety and Health Plan

TtEC – Tetra Tech EC, Inc.

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Job/Task: Clearing and Grubbing	Overall Risk Asses	ssment Code	e (RAC)	(Use highest	code)	M
Project Location: Hunters Point Naval Shipyard, San Francisco, California	Risk	Assessmen	t Code (R	RAC) Matrix	K	
Contract Number: N62473-10-D-0809, CTO 0015	Severity			Probability		
Date Prepared: August 21, 2013	Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Dan Keenan, SSHO	Catastrophic	E	E	Н	Н	M
Trepared by (Name/True). Dan Reenan, 55110	Critical	E	Н	Н	M	L
Pariawad by (Nama/Titla), Pagar Margatta CHI CSP Program CHI	Marginal	Н	M	M	L	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Negligible	M	L	L	L	L
	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (see above).					
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must	"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely. RAC Chart					Chart
review and be familiar with all provisions of the approved APP/SSHP.	"Severity" is the outcome/degree if an incident, near miss, or E = Extremely High Risk					ly High Risk
TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.	accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible. H = High Risk					sk
	Step 2: Identify the RAC (Prol for each "Hazard" on the AHA	•	• / /		1 = Modera	te Risk
	at the top of the AHA.	. Timotate the	Overall illg.		L = Low Risl	k

AHA #6 – Job/Task: Clearing and Grubbing							
	Job Steps	Hazards	Controls	RAC			
1.	Use heavy equipment to access or remove shrubs, trees, and debris.	Workers could be struck by or against heavy equipment.	Wear high-visibility reflective vests when exposed to vehicle traffic. Make eye contact with operators before approaching equipment. Understand and review posted hand signals. Use signs, flags, and backup spotters.	M			
		Workers may fall from aerial lift.	If using an aerial lift to access trees, ensure operator is trained in the use of the lift. Do not climb on or outside of basket railings. Use fall protection devices such as a full body harness and lanyard attached to a designated anchor point				

	Job Steps	Hazards	Controls	RAC
1.	Use heavy equipment to access or remove shrubs, trees, and debris. (Continued)		inside the lift, if required for the type of lift used. Ensure lift is positioned on stable, even surface before extending.	
		Aerial lift might contact overhead utilities.	Maintain adequate clearance from utilities, minimum 15 feet from power lines.	
		Workers struck by falling shrubs, trees, or debris.	Stand away from objects as they are being uprooted or removed. Barricade area where limbs or branches will fall to prevent inadvertent entry.	
		Exposure to poisonous plants could cause skin rashes.	Wear long sleeves or protective coverall. Be aware of the characteristics of poison oak (3 leaves, in fall, reddish in color). Avoid contact with poison oak. Although clothing may initially protect, contaminated clothing when handled could still expose the worker. Always wash hands thoroughly after working in areas with poison oak. Use protecting creams.	
2.	Load and haul materials.	Failure to follow Waste Management Plan could cause waste to be rejected by disposal facility. Waste could fall off truck and strike traffic. Waste could start on fire.	Be sure materials are secured to vehicle transporting them. Cover so that materials do not fall off truck. If materials are consolidated into a truck for hauling to a disposal site, ensure that all material is compatible and acceptable for the disposal site. Do not mix chemical wastes with debris or containers containing any materials (dispose of these separately as required by the waste management plan).	L
		Noise could cause hearing loss.	When handling vegetation, use leather gloves. Hearing protection is required when sound levels continuously exceed 84 dBA. Usually this will only apply to workers working in unenclosed cabs of heavy equipment or ground workers working near heavy equipment.	
3.	Remove trees/shrubs root system and other underground debris.	Underground utilities.	Physically verify the location and depth of existing utilities prior to starting excavation through geophysical and utility survey. Call National One Call, 811, prior to any disturbance of the ground. Scan the excavation area with electromagnetic and sonic equipment and mark the ground where existing underground utilities are discovered. Protect all existing utilities during excavation. Perform excavation within 18 inches of existing utilities by hand and/or nonaggressive methods as required by Cal-OSHA. Protect all underground utilities as soil is removed around or under the utility line.	M
		Potential underground gas pockets could be explosive.	Note any abnormal odors indicating the presence of gases. STOP WORK! Use combustible gas meter to determine if gases are flammable. If the LEL is at 10% or greater, do not continue. Contact the Project Manager and PESM.	

A .	HA #6 – Job/Task: Clearin	T C	Controls	DAC
_	Job Steps	Hazards	Controls	RAC
3.	Remove trees/shrubs root system and other underground debris. (Continued)	Sharp objects and debris could cause cut or puncture injuries to workers.	Handle debris with leather, cut/puncture-resistant gloves.	
		Strains from manually moving materials, shrubs, trees, and debris could injure workers.	Personnel shall be directed to use proper lifting techniques such as keeping the back straight, lifting with the legs, avoiding twisting at waist, and getting help in moving bulky/heavy materials and equipment.	
			Use mechanical assistance whenever possible.	
			Employees will not lift more than 50 pounds alone.	
			Objects that are bulky with unevenly distributed weight or objects heavier than 50 pounds require more that one person.	
			If material is lifted using chains, slings, or wire ropes, these devices must be inspected and rated for the weight of the load being lifted regardless of the height the material is raised. Follow safe rigging techniques.	
			Refer to EHS Procedure 3-1, Ergonomics.	
		Exposure to insects, snakes, animals could cause stings, poisoning, or disease.	Be aware that snakes often can take shelter near objects that are on the ground. Poke around or prod before moving the object with your hands.	
			Bees, hornets, and wasps often nest in various objects as well as in shrubs and trees. Before disturbing any object or area, look for these insects. Anticipate.	
		Potential exposure to chemical hazards and dust.	Perform air monitoring as specified in the SSHP. Wear required PPE. Minimize generation of dust. Use dust control measures.	
4.	Use power and hand tools.	Strains could result from use of tools, such as shovels, axes, chain saws, and brush trimmers. Workers could cut themselves using tools.	Maintain steady pace when using tools and take adequate rest periods. Use appropriate tools for the task and maintain tools in good condition. Wear leather work gloves when using tools. Avoid working too close to other workers. Wear full denim or heavy pants when using weed and brush trimmers.	M
		Noise from power equipment – chain saws, weed cutters, vehicles – could cause hearing loss to workers.	Hearing protection is required when sound levels continuously exceed 84 dBA.	
		Struck by or against chain saw.	Follow safe work practices. Wear cutting chaps. Ensure that saw interlock is operable. The saw must automatically shut off when the trigger is released. Wear required safety gear—hard hat, steel-toe boots, safety glasses, and hearing protection.	

Job Steps	Hazards	Controls	RAC
4. Use power and hand tools. (Continued)		Only trained personnel will operate saw. At no time will saw be used at a level higher than the chest level of the operator.	
	Workers could be struck by flying debris from chain saws or brush trimmer.	Stand as far away as possible from other workers in the same area. Wear PPE. Avoid actions that cause debris to fly higher or further.	
	Loading trucks.	Prohibit truck drivers from standing near trucks as they are being loaded. Prohibit truck drivers from sitting in the cab of trucks as they are being loaded, unless the truck is equipped with a cab protector (Falling Object Protective Structure [FOPS]).	
5. Fuel handling.	Handling of fuel for chain saws, vehicles, and brush trimmer may expose workers to fuel.	Review MSDS/SDS for fuel with all workers. Workers will be instructed on fuel transfer procedures. Wear protective nitrile gloves when handling fuel.	L
	Spills can cause environmental damage.	Use procedures that prevent fuel from spilling. Fuel only in a designated area that has spill protection and control. Have spill control material available and clean up all spills immediately.	
6. Use of mowing equipment.	Refueling may cause spills or fire.	Refuel lawn mowers or other equipment only in a designated area. Do not refuel any equipment that is located on a pickup truck or trailer. Refuel equipment on a level surface such as concrete. Clean up all spills immediately using readily available spill control materials. Report any spills. Do not refuel hot equipment. Allow the engine to cool. Smoking is never allowed during any fueling operation. Wear PPE and chemical protective gloves, such as nitrile gloves.	M
	Operation may cause debris to fly out from mower.	Wear proper PPE, especially safety glasses and hearing protection (most cutting equipment produces noise of at least 92 dBA). When using weed trimmers, wear leg protection or wear heavy fabric pants	
		such as denim or canvas.	
		Perform a foreign object and debris check prior to using any mowing or lawn cutting equipment. Ensure that other people are not within the vicinity of cutting equipment. Other people must maintain a safe clearance distance. Inspect all equipment before use, especially any cutting blades and the attachments.	

AHA #6 – Job/Task: Clearing and Grubbing				
Job Steps	Hazards	Controls	RAC	
6. Use of mowing equipment. (Continued)	Mower may tip while being operated, causing injury to workers.	Never ride a mower along the horizontal plane of a steep slope. Ride perpendicular to the grade when riding a mower uphill or downhill. Operate mower at a safe speed. Watch for pits, depressions, large rocks, and any other object that could destabilize the mower.		

AHA #6 – Job/Task: Clearing and Grubbing				
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements		
Hand tools, power tools, site vehicles, heavy equipment, and lawn mowers	Only trained equipment operators may operate heavy equipment; only DMV-licensed personnel will operate trucks. Specific training on the use of lawn mowers, brush trimmers, chain saws and other cutting equipment is required. Specific training is required on rigging if chains, wire ropes, or slings are used to lift trees and other objects. Qualified person for rigging and lifting must be designated by PjM or Superintendent. Specific training is required for the operation of aerial lifts.	Inspect daily and before use. Do not use equipment that is damaged. Ensure that cutting equipment has proper guards installed before use. Ensure cutting equipment is properly sharpened.		
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.		
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first-aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1, and Cal-OSHA (8 CCR 5812). Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used.		

Abbreviations and Acronyms:

AHA – Activity Hazard Analysis

APP – Accident Prevention Plan

Cal-OSHA - California Occupational Safety and Health Administration

CCR – California Code of Regulations

CFR – Code of Federal Regulations

CIH – Certified Industrial Hygienist

CSP – Certified Safety Professional

CTO – Contract Task Order

dBA – decibels, A-scale

DMV – Department of Motor Vehicles

EHS – Environmental Health and Safety

EM – Engineer Manual

LEL – lower explosive level

MSDS – material safety data sheet

PESM – Project Environmental Safety Manager

PPE – personal protective equipment

RAC – Risk Assessment Code

SDS – Safety Data Sheet

SSHO – Site Safety and Health Officer

SSHP – Site Safety and Health Plan

Job/Task: Site Restoration and Demobilization	Overall Risk Assessment Code (RAC) (Use highest code)				M	
Project Location: Hunters Point Naval Shipyard, San Francisco, California	Risk Assessment Code (RAC) Matrix					
Contract Number: N62473-10-D-0809, CTO 0015	Probability Severity					
Date Prepared: August 21, 2013	Severity	Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Dan Keenan, SSHO	Catastrophic	E	E	Н	Н	M
Trepared by (Name/True). Dan Rechan, 55110	Critical	E	Н	Н	M	L
Reviewed by (Name/Title): Roger Margotto, CIH, CSP, Program CIH	Marginal	Н	M	M	L	L
Reviewed by (Name/Titte). Roger Margotto, Citi, CSI, Frogram Citi	Negligible	M	L	L	L	L
	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (see above).					
Notes: (Field Notes, Review Comments, etc.) In addition to the information listed in this AHA, all field personnel must	"Probability" is the likelihood to cause an incident, near miss, or accident and is identified as Frequent, Likely, Occasional, Seldom, or Unlikely. RAC Chart					Chart
review and be familiar with all provisions of the approved APP/SSHP.	"Severity" is the outcome/degree if an incident, near miss, or E = Extremely High Risk					
TtEC Corporate Safety Programs and the EM 385-1-1 will also be available on-site for review of specific materials and mitigation measures.	accident did occur and is identified as Catastrophic, Critical, Marginal, or Negligible. H = High Risk			k		
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L M = Moderate Risk			te Risk		
	for each "Hazard" on the AHA at the top of the AHA.	. Annotate the	overall high	hest RAC L	= Low Rish	K

AHA #7 – Job/Task: Site Restoration and Demobilization					
Job Steps	Hazards	Controls	RAC		
Pick up any debris and clean up the site.	Material handling could expose workers or subsequent users of fields to injury.	Identify and avoid pinch points. Maintain communication with others involved in material handling. Ensure that a complete sweep of the area is conducted to remove all supplies and equipment from the area. Watch footing and walking paths.	М		
	Strains from manually moving materials and equipment.	Use proper lifting techniques such as keeping back straight, lifting with legs, avoiding twisting at waist, and getting help when moving bulky/heavy materials and equipment. Use lifting devices whenever possible.			

A	AHA #7 – Job/Task: Site Restoration and Demobilization					
	Job Steps	Hazards	Controls	RAC		
1.	Pick up any debris and clean up the site. (Continued)		Do not lift more than 50 pounds without assistance. Rotate repetitive tasks with other workers.			
2.	Perform general cleanup of equipment (washing and decontamination).	Workers could be exposed to site contaminants.	Wear PPE consisting of nitrile gloves; polytyvek coveralls (or PVC rain suit); and rubber, latex, or other type of boot covers; safety glasses, face shield, hard hats, and steel-toe boots are also required when washing equipment and tools.	L		
		Areas can be slippery.	Wear slip-resistant boots. Avoid walking on wet poly sheeting.			
3.	Conduct final site inspection.	Trip hazards and other hazards that were not previously noted.	Inspect areas carefully again and note any observed hazards. Prepare a corrective action list.	L		

AHA #7 – Job/Task: Site Restoration and Demobilization			
Equipment to be Used	Training Requirements/Competent or Qualified Personnel Name(s)	Inspection Requirements	
Motorized vehicles, hand tools, power tools	Only DMV-licensed personnel will operate trucks. Review operators' manuals.	Daily or before use. Equipment must be inspected and certified as operational by a qualified person.	
	Specific training for power tools, hand tools, and electrical safety.	The SSHO will inspect electrical cords and connections daily.	
Fire extinguishers	Fire Extinguisher Training including use/limitations.	At least monthly by SSHO or designee.	
First-aid kits and other emergency equipment	Personnel require training to use emergency equipment and first-aid kits. These personnel must be familiar with this plan, the inspection criteria for the equipment, and how the equipment is used. The SSHO provides direction on the use of the equipment.	Initially and at least weekly thereafter or after the kit is used and restocked (29 CFR 1926.50[d][2]). First-aid kits must be filled per EM 385-1-1 Table 3-1, and Cal-OSHA (8 CCR 5812). Eyewashes inspected weekly. Potable water changed weekly unless a preservative solution is used. Fire extinguishers inspected monthly.	
Abbreviations and Acronyms: AHA – Activity Hazard Analysis APP – Accident Prevention Plan Cal-OSHA – California Occupational Safety and Health Administration CCR – California Code of Regulations	CFR – Code of Federal Regulations CIH – Certified Industrial Hygienist CSP – Certified Safety Professional CTO – Contract Task Order DMV – Department of Motor Vehicles EM – Engineer Manual	PPE – personal protective equipment PVC – polyvinyl chloride RAC – Risk Assessment Code SSHO – Site Safety and Health Officer SSHO – Site Safety and Health Officer TtEC – Tetra Tech EC, Inc.	

APPENDIX B

SELECT ENVIRONMENTAL HEALTH AND SAFETY PROCEDURES (on CD only) This page intentionally left blank.

EHS 1-1: Responsibilities for Program Implementation

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 06/09/2008

The purpose of this program is to outline personnel responsibilities relative to implementing the Tetra Tech EC, Inc. (TtEC) Purpose:

Environmental, Health and Safety (EHS) program and achieving the objectives of the Environmental, Safety and Quality

(ESQ) policy.

Version Date:

08/06/2008 - New

Original Issue Date:

02/01/95

Category:

Company Procedures

Sections:

ESQ - Environmental Health & Safety Programs

Sub Category:

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Procedure

Keyword

Index:

EHS Compliance/Waste

Management, EHS

Compliance/Spill ReportingChange Management/Contract, Field Activities/Science, Training

Skip Parry

Approved By:



1.0 PURPOSE

2.0 SCOPE

3.0 MINIMUM REQUIREMENTS

4.0 GUIDANCE

5.0 REFERENCES



1.0 PURPOSE

The purpose of this program is to outline personnel responsibilities relative to implementing the Tetra Tech EC, Inc. (TtEC) Environmental, Health and Safety (EHS) program and achieving the objectives of the Environmental, Safety and Quality (ESQ) policy.



2.0 SCOPE

This program applies to all TtEC operations.



3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Employees

TtEC and subcontractor employees have the responsibility to:

- a. Work in a safe, healthful, and environmentally compliant manner, in accordance with TtEC programs, TtEC procedures, TtEC work rules, and applicable laws and government regulations.
- b. Be an active participant in the project's Voluntary Protection Program (VPP), when applicable.
- c. Participate in resolving problems and corrective actions.d. Strive for Zero Incident Performance® (ZIP).
- Stop work if an imminent danger situation exists.
- Notify their supervisor immediately of any work-related injury, illness, spill, release, permit exceedence, or high loss potential incident; of any environmental issue or safety hazard in the workplace; or of any concern regarding the TtEC

program. If employees are unable to obtain resolution at the local level they are required to notify ESQ Program Directors or call the Compliance Hotline at 1-800-468-3191.

Attend EHS training.

All TtEC and subcontractor employees performance is evaluated regarding compliance with EHS regulations and program requirements.

3.1.2 Line Management

Line Management, the Project Manager or Officer Manager, ensures that all company activities are executed in accordance with TtEC EHS programs, procedures, and applicable regulations. Line managers have primary EHS responsibility and have EHS personnel support to help them fulfill this responsibility. Line managers have the responsibility to integrate loss control principles into all operations and to ensure that:

- a. TtEC's safety culture is preserved by demonstrating commitment and program involvement.
- b. Safety remains a major project goal and is not subordinated to other demands.
- c. Project-specific continuous improvement goals and objectives are based on the TtEC's ZIP Operating Philosophy and apply to self perform and subcontractor operations alike.
- d. Project goals and objectives are developed based on EHS events and issues, and are communicated to TtEC employees and subcontractors.
- e. All projects are implemented in compliance with all environmental, safety and health laws and regulations, EHS program requirements, and Environmental Management System (EMS) requirements.
- f. EHS plans are developed, approved, and implemented in accordance with TtEC requirements.
- g. Personnel understand the requirements of the project EHS plan(s) and each individual understands his/her responsibility for plan implementation.
- h. Personnel have all required training and are capable of performing all assigned tasks.
- i. Corporate professionals or external resources, such as private consultants, are available for project support as needed.
- j. Project staff members are aware of, and have access to, technical information that TtEC maintains in the Corporate Reference Library, various EHS databases, and online regulatory subscription services. Additional EHS reference books and technical information are also available to project staff upon request.
- k. Facilities and equipment meet TtEC and government regulations.
- I. Work rules are enforced.
- m. Inspections and incident investigations are conducted per program requirements.
- n. Effective corrective actions are implemented in a timely manner following inspections, audits, incident investigations, etc.
- o. Employees, including subcontractors, are not only encouraged, but are required to notify their supervisor of any actual or potential health and safety hazards in the workplace and develop safe work methods and controls to be implemented in project Activity Hazard Analyses (AHAs). Employees, and subcontractors, are also assured that not only will they not be harassed for reporting problems, they may be rewarded for it.
- p. Clients are notified of TtEC incident reporting procedures.
- q. Appropriate disciplinary action is implemented by line supervision when necessary.
- r. Environmental and Safety Coordinators (ESC) are assigned for each home office, in coordination with the Manager, EHS Services.

Management responsibilities necessary to maintain a safe, healthful, and environmentally compliant workplace are identified in each procedure of the TtEC EHS program.

3.1.3 EHS Personnel

EHS personnel assist management with implementation of TtEC EHS programs and procedures, and help to ensure that operations are performed in compliance with applicable laws and regulations. EHS personnel have the responsibility to:

- a. Ensure that TtEC employees understand the requirements of TtEC EHS programs and procedures through training and communication. (ESS)
- b. Develop or assist with the development of EHS plans in conjunction with project personnel. (ESS)
- c. Approve or obtain approval of all EHS plans. (PESM)
- d. Assist management with EHS plan implementation. (ESS, PESM)
- e. Perform specific tasks in accordance with EHS plans. (ESS, PESM)
- f. Ensure that TtEC employees receive required EHS regulatory training. (PESM)
- g. Function as a technical resource of all environmental compliance, safety, loss control, and industrial hygiene issues.
 (PESM)
- h. Fulfill the specific responsibilities for project EHS personnel that are identified within each EHS procedure. (ESS, PESM)
- i. On each project with an EHS plan, an Environmental and Safety Supervisor (ESS), is assigned to assist line management with EHS Program implementation. The ESS may have collateral duties.

3.1.4 Environmental and Safety Coordinator

The ESC has responsibility to coordinate the administrative EHS functions in offices. The ESC has the responsibility to:

- a. Assist in coordinating EHS training by identifying training needs, and conducting or arranging for training.
- b. Ensure that appropriate EHS records are maintained and forwarded to the Director, ESQ in accordance with EHS programs.
- c. Assist in completing and forwarding copies of incident reports and investigations to the Manager, EHS Services, and the Director, Health and Safety Programs.

- d. Assist in implementing EHS committees.
- e. Assist in developing, implementing, and maintaining EHS awareness programs.
- f. Assist the Operations Manager in conducting and documenting quarterly office and warehouse EHS inspections and in closing out and documenting corrective actions taken.
- g. Ensure Emergency Response Plans are written, implemented, maintained, and communicated to employees.
- h. Ensure mechanism exists in the office to identify, communicate, and correct employe EHS concerns.
- i. Ensure an adequate ergonomics program is implemented.

3.1.5 Managers, EHS Services

The Managers, EHS Services have responsibility to:

- a. Establish goals, direction, and performance standards to EHS personnel within their region.
 - i. Ensure availability of required resources within region.
 - ii. Manage work loads and distribution of area staffing (employee mix).
 - iii. Ensure professional development of staff.
- b. Communicate and monitor performance of EHS personnel.
- c. Provide feedback and status reports, including statistics to the Director, EHS Programs.
- d. Provide senior technical support to operations management.
- e. Raise/elevate issues of potential noncompliance to ESQ Program Directors.
- f. Ensure, in coordination with the Operations Manager, that an ESC is assigned to each home office.
- g. Provide oversight, evaluation, and training for collateral duty personnel, and approve project assignments.
- h. Monitor projects being conducted in region through continued interface with area, office, and project management.
- i. Support proposal and Business Development efforts.
- j. Approve EHS plans, as appropriate.
- k. Make technical and regulatory interpretations as required.

3.1.6 ESQ Service Directors

The Director, Environmental Health and Safety Services, and Director, Quality Services have responsibility to:

- a. Maintain ultimate authority in respective disciplines for program implementation, technical issues, and staffing decisions.
- b. Maintain and update program standards, and ensure that they meet appropriate regulatory and TtEC requirements.
- c. Provide input on staffing issues including performance appraisals and professional development.
 d. Participate in ESQ program audits.
 e. Identify and ensure appropriate resolution of issues related to respective technical area.

- f. Identify technical information needs and disseminate technical information.
- g. Support proposal and business development efforts and coordinate technical support on major proposals.
- h. Perform internal and external project support.
- i. Update and maintain training programs relative to their technical areas.
- j. Foster departmental integration through leadership and example.
- k. Ensure that incidents are properly investigated with appropriate follow-up and closure.

3.1.7 Vice President, Environmental, Safety and Quality Services

The Vice President, ESQ Services is responsible for all departmental activities and has the responsibility to:

- a. Provide overall direction and leadership of the ESQ program.
- b. Provide the necessary support to line management to ensure that Corporate ESQ and EMS programs are implemented.

- c. Coordinate EHS related national contracts.
 d. Provide major proposal and business development support.
 e. Maintain the TtEC ESQ programs and guidance documents.
- f. Make recommendations to TtEC management to improve the quality of the TtEC ESQ program.
- g. Oversee ESQ training program development and implementation to help ensure that TtEC and subcontractor employees perform their jobs in accordance with ESQ programs, procedures, and applicable laws and regulations.
- h. Manage the TtEC medical surveillance program.
- Ensure effective communication to all TtEC employees on EHS issues, incidents, and regulations.
- j. Prepare final VPP self-evaluation reports to each applicable OSHA region as described in Section 3.2 below.

These responsibilities may be delegated to the ESQ Program Directors.

3.2 Voluntary Protection Program (VPP) Annual Self-Evaluation

For projects that have adopted the VPP, line management shall conduct an annual self-evaluation of the five elements of VPP and the project-specific VPP requirements. In the last quarter of each year, line management for each active VPP project

performs an annual self-evaluation of the five elements of VPP for the previous year.

This evaluation is not the same as a safety audit; it is a review and assessment of the effectiveness of the VPP elements:

- a. Management Leadership
- b. Employee Involvement
- c. Worksite analysis
- d. Hazard Prevention and Control
- e. Health and Safety Training

The annual self-evaluation shall assess the project's natural work groups, including subcontractors, and applicable components of the EHS program to verify VPP implementation and achievement of goals and objectives. Self-evaluations should also include an assessment of action items completed and recommendations for improvements.

The line manager shall transmit a copy of the project's VPP self-evaluation to the TtEC Vice President, ESQ Services.

The Vice President, ESQ Services will prepare the final report to each applicable OSHA region in narrative form, and include a description of any success stories, such as:

- a. Reductions in worker's comp rates
- b. Increases in employee involvement
- c. Improvements in employee morale, etc.

Line management will also provide the following information to the TtEC Vice President ESQ Services for self-performed and applicable subcontractor work for inclusion in the annual VPP report:

- Annual rate of injury incidence
- Lost workday cases
- Employment figures
- Hours worked by employees and subcontractors

Significant project organizational or ownership changes, or changes with the authorized collective bargaining agent(s), require that new VPP Statements of Commitment be signed. These changes require notification and signed statements be sent to the applicable OSHA Regional VPP Administrator within 60 days.



4.0 GUIDANCE

4.1 Definitions

4.1.1 Environmental and Safety Coordinator (ESC)

The ESC and a TtEC employee assigned to coordinate EHS activities in a home office. The ESC performs EHS activities on a part-time basis, and has collateral duties. The ESC is designated by the Manager, EHS Services and is usually a member of the ESQ department. However, where no ESQ personnel are located in the home office, the ESC is selected from other departments. Employees who have completed the Environmental and Safety Supervisor (ESS) course will be given priority to perform ESC responsibilities. ESC responsibilities are defined throughout the EHS procedures.

4.1.2 Environmental and Safety Supervisor (ESS)

The ESS is a project employee assigned to oversee and assist with the implementation of the EHS plan and EMS and EHS programs. The ESS is qualified as the Health and Safety Supervisor required by 29 Code of Federal Regulations (CFR) 1910.120. The ESS may either be a dedicated full-time position or a collateral duty function. The ESS reports through the project organization to both the Site Manager and the Project Environmental and Safety Manager (PESM). ESS responsibilities are defined throughout the EHS procedures.

The ESS is qualified by the Director, EHS Services in accordance with EHS 1-11. The PESM designates specific employees to a project to perform the ESS role.

4.1.3 Project Environmental and Safety Manager (PESM)

The PESM is the TtEC employee assigned to assist the Project Manager in the development of a project-specific EHS plan and in the implementation of EMS and EHS programs. The PESM is a Senior EHS Scientist and typically oversees multiple projects. The PESM has approval authority for EHS issues, and assumes 'key person' roles such as "Certified Industrial Hygienist," "Corporate Health and Safety Officer," "Environmental Compliance Manager," or "EHS Manager" for the project. The PESM reports to both the Project or Program Manager and the Manager, EHS Services. PESM responsibilities are defined throughout the EHS procedures



5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
Voluntary Protection Program (VPP) Policy	û
2. Environmental Management System (EMS)	G
3.	
4.	

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EHS 1-2: Awareness and Recognition Programs

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 06/10/2008

Purpose: The purpose of this program is to provide minimum standards and guidelines for establishing Environmental, Health and

Safety (EHS) awareness and recognition programs for Tetra Tech EC, Inc. (TtEC).

Version

06/27/2008 - New **Original Issue Date:** 02/01/95

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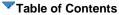
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Training, Field Activities/Environmental H&S Document Owner: Skip Parry

Approved By:



Section

1.0 PURPOSE

2.0 SCOPE

3.0 MINIMUM REQUIREMENTS

4.0 GUIDELINES

5.0 REFERENCES

1.0 PURPOSE

The purpose of this program is to provide minimum standards and guidelines for establishing Environmental, Health and Safety (EHS) awareness and recognition programs for Tetra Tech EC, Inc. (TtEC).

2.0 SCOPE

This Program applies to all operations.

3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Line Management

The Operations, Program, or Project Manager, together with the responsible EHS personnel, shall implement an awareness program in accordance with Section 3.0 of this Program, is responsible for providing an adequate budget to carry out the program, and shall ensure its implementation.

3.1.2 EHS Personnel

The Environmental and Safety Coordinator (ESC), or Environmental and Safety Supervisor (ESS) shall assist in developing and implementing awareness programs, including any record keeping requirements of the program.

The Managers, EHS Services shall provide oversight of the awareness and recognition programs. Oversight shall include review of the content and implementation of the awareness and recognition programs, and ensuring consistency with this Program.

3.2 General Requirements

Awareness programs and activities are meant to focus attention on issues that may have an impact on environmental awareness

http://info.tteci.net/apps/groups/compliance/corpproc.nsf/d9055562b7654d27852572cf0... 6/19/2013

or protection, safety or the well being of TtEC employees and subcontractors. This focus is also maintained through implementation of other programs including:

- a. Committees through rotating membership and publishing of minutes.
- b. Meetings through presentation of issues and procedures relevant to the local workplace and providing an opportunity for questions and discussions.
- c. Incident investigation and reporting by providing for casual analysis and follow-up on workplace hazards and environmental compliance issues.
- d. Inspections through proactive identification of environmental issues and hazard analysis, identification of findings, assessment of compliance, and closure of corrective actions.

When properly implemented, the above programs are considered part of the overall EHS Awareness Program. This program will discuss additional methods of communication, which serve to raise and maintain awareness, and provide for the recognition of desired behavior and achieved goals.

3.3 Awareness Program Requirements

3.3.1 Bulletin Boards or Posting Areas

Offices and project sites with office or field trailers shall provide a bulletin board or posting area designated for EHS postings. At a minimum, the following shall be posted:

- a. Corporate ESQ Policy
- b. Compliance Hot Line Poster
- c. Zero Incident Performance Pledge Poster
- d. Legally required posters, e.g., OSHA Notice

- e. EHS Work Rules f. DIR Principles g. Emergency Phone Numbers and Procedures
- h. Evacuation Route Maps
- i. OSHA 300 Summary (During February for previous calendar year)
- j. Committee Meeting Minutes (most recent), if applicable
- k. EHS Bulletins and memos regarding new regulations, EHS lessons learned, Environmental Management System (EMS) postings, or other pertinent EHS topics.

Bulletins and memos can be from any source. The bulletins shall involve issues of local concern. Each bulletin shall include a statement of the problem or issue; impacts on the site or the employee; a brief summary of related company rules or government regulations; and actions individuals can take to avoid the problems discussed or to improve the Company's standing relative to the issue. For readability, the bulletins shall be limited to one page in length.

3.4 Corporate Recognition Programs

The President's Award for Health and Safety Excellence. This award will be given each year if a program, project, or office demonstrates an advanced level of commitment to Health and Safety issues through an outstanding record of achievement in this area and performance well in excess of TtEC and client expectations. Each December, the Director, Health and Safety will solicit nominations. The recipient will be chosen by the Corporate Managers from nominations submitted which detail the achievements of the Office or Project. The recipient(s) of the President's Award for Health and Safety Excellence will be presented with a plaque.

The President's Award for Environmental Excellence. This award will be given each year if a program, project, or office demonstrates an advanced level of commitment to TtEC's Environmental Management System. Each December, the Director, Environmental Programs will solicit nominations. The recipient will be chosen by the Corporate Managers from nominations submitted which detail the achievements of the Office or Project. The recipient(s) of the Presidents Award for Environmental Excellence will be presented with a plaque. The first issue of this Award will be in 1999 for 1998 performance.

3.5 Approval and Budgeting

The Operations, Program, or Project Manager with the support of executive management is responsible for budgeting to implement Awareness Programs and project or office Recognition Programs.

Recognition Programs that include financial incentives must be included in the project or EHS Incentive Plan and reviewed and approved in accordance with Section 5.0, Personnel Practices Procedure, PP-2, Compensation.

3.6 Subcontractors

TtEC subcontractors shall be included in Awareness Programs when appropriate.

Office or project recognition programs may include subcontractors at the discretion of the Project or Operations Manager.



4.0 GUIDELINES

4.1 Definitions

4.1.1 Awareness Program

A program designed to promote safe work and environmentally compliant practices, or effective implementation of the Environmental Management System, through the use of communications, gifts, and events. Awareness activities are not performance based.

4.1.2 Recognition Program

A program designed to promote a high level of environmental, health and safety performance through positive reinforcement of appropriate behavior. Recognition programs consist of publicly granting awards for achievements in the area of EHS.

4.1.3 Major Project

A contract with multiple delivery orders or a single field project with an estimated minimum of 50,000 work hours per year. The work hours include both TtEC and subcontractor hours.

4.2 Awareness Program Guidelines (Optional)

This section provides guidelines and optional program elements that may be used to enhance a workplace EHS Awareness Program.

4.2.1 Posters

Project and office sites should display informational posters or banners on EHS topics in areas routinely used by site personnel. These posters should be changed monthly.

Posters should be selected based on the particular issues having a significant impact on the operations of the site. These issues should be identified through analysis of previous incidents; audit findings; inspection results; activity hazard analyses; notices of non-compliance; committee or employee suggestions; exposures of concern; or regulatory requirements. For this reason, poster subscription services, although easy, may not always be effective in providing the appropriate messages.

4.2.2 Awareness Gifts

Awareness gifts are designed to focus attention on EHS issues and are not associated with specific goals or achievements like recognition awards. They may be given out spontaneously or as a part of a planned program. EHS awareness gifts should be useful but of nominal value. They should be directly related to a specific EHS issue or include a message about the issue. Examples would be a home smoke alarm during October (National Fire Prevention Month) or a cap or tee shirt with a safety or environmental compliance message.

4.2.3 Critical Topic Campaigns

The uses of awareness materials and gifts are most effective when they are combined in a structured, needs-based program called a Critical Topic Campaign (CTC). To implement a CTC the Office/Program/Project Manager, together with the ESC, should:

- a. Conduct a needs analysis and determine which EHS topics are likely to be the most critical to the success of the operations for a coming period (usually a year);
- b. Coordinate the activities or elements in a campaign fashion during a specified period of time, e.g., one month, to reinforce a specific issue or message.
- c. Select three or four separate activities or elements to implement for each critical topic. Examples are:
 - i. Posters/banners
 - ii. Awareness gifts
 - iii. Bulletins/memos
 - iv. Contests
 - v. Recognition Awards/Booklets
 - vi. Special Meetings
 - vii. Special Training
 - viii. Guest Speakers or Demonstrations
 - ix. Special Event (lunch, picnic, etc.)

4.3 Office and Project Recognition Programs (Optional)

Recognition programs should relate to other programs or site objectives such as a Critical Topic Campaign or Pollution

Prevention objective. Office and Project Recognition Programs are not required by this program. However, when they are used as part of the EHS program, they shall adhere to the following requirements:

- a. **Personal Achievement Awards**. Personal achievement awards may be given when a period is completed without incident and without breech of procedure or site rules. Personal achievement awards shall not be given solely on the basis of achieving a period of time without an accident/incident. Personal achievement awards shall be distributed to all program participants that meet the award criteria, even if they no longer work at the site at the time of distribution.
- b. **Group Achievement Awards**. Group achievement awards may be given to all eligible site or office personnel when a goal or significant milestone is achieved. If the site or office is divided into more than one group, a reasonable degree of equity in numbers of personnel in each group and exposure to hazards must be ensured.

NOTE: Although Personal and Group Achievement Awards should be based on meeting established goals, these goals and the awards need not be announced to site personnel at the beginning of the period. They can be distributed with an explanation upon achievement of the award. This method may serve to reduce the temptation to withhold incident reports, as well as the assumption that awards are expected or owed as part of the compensation package. Also, Achievement Awards will not be given to those whose actions or suggestions result from execution of normal and expected job responsibilities.

- c. *Special Awards*. The Office/Project Manager may also establish a grand prize drawing consisting of one or a few prizes of significant value to be awarded at the completion of the project or a significant period of time. This award may be granted based on nominations of personnel who make significant contributions to the EHS program with final selection by the group. Another way to award a grand prize is through a lottery system. In this type of program, personnel earn lottery chances each time they receive interim achievement awards. People who consistently earn the interim achievement awards then have the greatest chance of winning the grand prize. Employees with supervisory responsibilities will not usually be eligible for grand prizes associated with personal achievement awards.
- d. *Positive Participation Awards*. Consideration should be given to establishing awards for positive participation in the EHS Program. Examples are awards for: the best EHS suggestion; safety slogan contests; committee or inspection team participation; observed safe and environmentally compliant behavior; significant efficiency improvements that impact environmental excellence or health and safety. Professional or designated EHS personnel will not be eligible for Positive Participation Awards.
- e. *EHS Slogan Contest*. Annual EHS slogan contests may be used to promote environmental safety awareness. A prize for the best slogan may be awarded. The selected slogans may be used in a variety of ways including banners, posters, communications headers, and as imprints on awareness gifts.
- f. *Value of Awards*. Achievement awards based on completing a specified period of time without incidents or violations should be either EHS-related gifts or cash equivalent (cash, check, gift certificate, points toward catalog purchase). The Program, Project or Operations Manager will make a recommendation regarding the value of the award based upon site -or office-specific criteria. This recommendation will be approved per Section 3.5.

TtEC's recent safety theme - Save a Fellow Employee, was an awareness campaign developed as a result of employee involvement and incentive initiatives, and will help focus on safety of others. See Zip Bulletin 182.

Employees, including subcontractors when appropriate, are made aware of the projects positive recognition programs, including any specific rewards and recognition programs that may be established for meeting project EHS goals and objectives, demonstrating exemplary actions, or assisting in project and/or employees in providing a safer workplace.

4.4 Postings

4.4.1 Lost-Time Incident (LTI) Sign

Each major project site should post a sign at the site which indicates the number of days and/or man-hours worked since the last lost-time accident. The ESS should ensure the LTI sign remains current. Statistics displayed on the sign should include those compiled for both TtEC and its subcontractors. The LTI sign should contain the TtEC name and the project name.

4.4.2 Zero Incident Performance (ZIP) Banner

Each major project site should post a Zero Incident Performance Banner at the entrance to the worksite. The banners should be visible from a distance and displayed in well-lighted areas.

5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column	
	a	

1. PP-2, Compensation	
2. Environmental Management System (EMS)	G
3. Zip Bulletin 182	ů.
4.	

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EHS 1-7: Event Reporting and Investigation

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Cindy Leong on 10/07/2009

Purpose:

The purpose of this program is to: (a) specify the types of events to be reported and investigated, including both safety and quality-related events; (b) define internal Tetra Tech EC, Inc.(TtEC) and external event notification requirements; (c) ensure proper management and follow-up of each

event; (d) meet regulatory notification and investigation requirements; (e) provide a mechanism to identify Environmental, Safety and Quality (ESQ) issues and areas for improvement and recognize job well done through the Zero Incident

Performance® (ZIP) Slip.

Version Date:

12/09/2009 - Revised

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Control, Training, EHS Compliance/Permits,

Nonconformance and Corrective

and Preventive Action

Approved By:

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1.0 PURPOSE

The purpose of this program is to:

- a. Specify the types of events to be reported and investigated, including both safety and quality-related events.
- b. Define internal Tetra Tech EC, Inc. (TtEC) and external event notification requirements.
- c. Ensure proper management and follow-up of each event.
- d. Meet regulatory notification and investigation requirements.
- e. Provide a mechanism to identify Environmental, Safety and Quality (ESQ) issues and areas for improvement and recognize job well done through the Zero Incident Performance® (ZIP) Slip.



2.0 SCOPE

Event reporting requirements apply to all operations of TtEC and its subsidiaries (the "Company"), including subcontractor activities. The term "Event Reports" in this procedure encompasses Quality Event Reports (QERs), Near Miss, and EHS Event Reports.



3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 All Personnel

All personnel shall immediately report any event (see Section 4.1.1) to their supervisor. The report can be verbal or in writing.

Employees, including subcontractors, are required to participate in the investigation process as directed, and comply with corrective actions identified. Employees are also made aware of trends and may be asked to help develop lessons learned to prevent similar events from occurring.

3.1.2 Line Management

Line Management, including the Office Manager for office events and the Project Manager (PM) for project events shall:

- a. Be responsible for all client notifications (Prior to initiation of project field activities, the Project Manager shall coordinate with the client to determine the appropriate agency notification responsibilities and procedures).
- b. Implement the appropriate internal notifications (see Table 1) as required by this program as soon as an event becomes known.
- c. The supervisor responsible for directly overseeing the work shall ensure completion of the Event Report. The supervisor shall directly participate in the causal analysis investigation.
- d. Ensure that corrective actions have been completed and properly documented.

3.1.3 Environmental Safety and Quality Personnel

Environmental Safety and Quality Personnel (Environmental Safety Coordinator, Environmental Safety Specialist, and Project Quality Control personnel) shall:

- a. Ensure that all notifications are made promptly.
- b. Ensure that all reports are fully completed.
- c. Ensure that all insurance and workers compensation forms are completed and submitted as necessary.
- d. Participate in event investigations of all Occupational Safety and Health Administration (OSHA) recordable injuries/illnesses, spills, releases, and other investigations.
- e. Communicate information about the event to applicable site and/or office employees.

3.1.4 Project Quality Control Manager

The Project Quality Control Manager shall review and approve QER investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The Project Quality Control Manager's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective corrective actions should be elevated to the Director, Quality Programs for further evaluation and potential additional programmatic corrective actions.

3.1.5 Project Environmental and Safety Manager (PESM)

The PESM shall review and approve event investigation results, proposed remedial actions, determine the Event Risk in accordance with CRL Guideline HSG 2-7, Risk Prioritization, and identify the need to verify the effectiveness of corrective actions taken based on severity of Event Risk. The PESM's evaluation of corrective action effectiveness should be summarized in the Comments section. Ineffective correction actions should be elevated to the Director, EHS Services for further evaluation and potential additional programmatic corrective actions.

3.1.6 Director, EHS Services

The Director, EHS Services shall:

- a. Notify OSHA of any injuries or illnesses occurring within OSHA jurisdiction as required.
- b. Review/maintain log which includes information on basis causes, immediate causes, and management control issues of all investigations.
- c. Distribute summaries of events with periodic management reports.
- d. Communicate significant events to key personnel within the Company.
- e. Review basic causes of Company events to identify trends.
- f. Recommend EHS program modifications as necessary.
- g. Immediately notify the Tetra Tech Health and Safety Manager of any serious accident and provide follow-up information on serious accidents.
- h. Provide Monthly Injury Reports to the Tetra Tech Health and Safety Director.

3.2 Notifications

In addition to the reporting responsibilities specified in Section 3.1, the responsible supervisor is required to notify_Work Care at 800-455-6155 (available 24 hours) of employee illness or injuries. Work Care's main office must be notified promptly of all injuries and illnesses so the affected employee receives prompt and appropriate medical advice. The call to Work Care must be made in addition to taking the affected employee to the local clinic. EHS 2-1, Emergency Preparedness, provides guidance for medical response and actions.

The responsible supervisor is also required to ensure notifications are made as outlined in Table 1.

The phone numbers and other means of contact for Company personnel shall be posted with the emergency notification list and/or integrated into the site-specific emergency notification list.

3.3 Event Report Generation

The information portion of the Event Report should be generated by the end of the supervisor's work shift on the day of the event, if possible, but no later than 24 hours after the event was reported by the supervisor and employee(s) involved in the event. The investigation completion time is provided in Section 3.4.

The Event Report and Investigation may be completed electronically in the Company Incident Database located on Lotus Notes or by hardcopy using Attachment A, Event Report and Investigation Form, or Attachment B, Quality Event Report Form. (Attachment C, Event Sketch, may be used to graphically depict <u>events</u>).

The forms are intended to be self-explanatory. If the supervisor or the employee has any questions regarding completion of the report, an ESQ representative should be contacted for support.

Both the employee(s) and the employee's supervisor must sign the Event Report.

For low loss-potential near misses, the ZIP Slip may be substituted for the standard Event Report. (See CRL Procedure PP-10, Employee Recognition).

3.4 Event Investigations

Event investigations are to be initiated and completed as soon as possible, but should be completed no later than 10 working days after the event has been reported.

Guidance for conducting investigations and cause analysis may be found in Section 4.3.

Table 1. Internal Notifications By Supervisor

EVENT TYPE	SUPERVISOR	TIMING ¹	WHO NOTIFIES	TIMING ¹

	NOTIFIES			
Spill/release or Permit Exceedence	ESS	Immediately	PESM and Director, EHS Services	Immediately if external reporting required
	Project Manager	Immediately	Client and Area/Program Manager Government agency if required by contract/plan and Director, EHS Services not available (See 3.5.2)	Immediately if external reporting required
Fatality, Hospitalization of 1 or more persons, Fire, or Explosion	ESS	Immediately	PESM and Director, EHS Services OSHA reporting (See 3.5.1) Insurance AIG through Chartis @ 1-800-910-2667 (Company personnel only) (Not required inside Washington State)	Immediately Immediately Immediately
	Project Manager	Immediately	Area/Program Manager VP Construction Client	Immediately Immediately Immediately
Confirmed or Potential OSHA Recordable	ESS	Immediately	PESM and Director, EHS Services Insurance AIG through Chartis @ 1-800-910-2667 (Not required in Washington State)	Same day Same day Same day
	Project Manager	Immediately	Area/Program Manager VP Construction, VP Remediation, VP C&E, COO Client, if required	Same day Same day 24 hours or as specified by contract
Equipment/Property/ Vehicle Damage	ESS	Immediately	PESM and Director, EHS Services	24 hours
	Project Manager	Immediately	Client (client property) Client (other property, if required) Equipment Manager Area/Program Manager VP Construction	Immediately 24 hours 24 hours 24 hours 24 hours
Potential Insurance Claim, other than Worker's Compensation	Project Manager	Immediately	Law Department and Procurement	24 hours
Office Events	ESC	Immediately	Operations Manager Director, EHS Services	24 hours

Quality Events	Project Manager Project QC Manager	_	-8	24 hours 24 hours
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¹Timing - Immediately - Real time verbal discussion or notification in writing Same Day

24 hours - written event report copy; Client notification, or as specified in contract or project specification ESS Environmental Safety Specialist ESC Environmental Safety Coordinator PESM Project Environmental and Safety Manager QC Quality Control VP Vice-President

Investigations that fall within the scope of the OSHA Process Safety Management Standard must meet the requirements of 29 Code of Federal Regulations (CFR) 1910.119(m). Projects that must meet this standard shall include the appropriate reporting requirements in project specific procedures or plans.

Project QC personnel should participate in the QER Cause Analysis and in determining an appropriate Action Plan.

Completed investigation reports should be submitted within 10 working days to:

- a. Project Manager or Office Manager for review and signature
- b. PESM or Project QC Manager (for QERS) for review and signature
- c. ESS (for projects) or ESC (for offices) for review and signature
- d. Director, EHS Services/Quality Services as applicable

Electronic submittal within 10 working days meets these reporting requirements. Additional reporting requirements are listed in Table 1.

The Project or Office Manager and the PESM, or Project Quality Manager must sign the report indicating their satisfaction with thoroughness of the investigation and the report and their concurrence that the action items address the identified causes. This constitutes the peer review, and the report, particularly the description, should be clear to readers not familiar with the project or incident.

3.5 External Notifications

3.5.1 OSHA Notification

Notification to OSHA is required within 8 hours if the event resulted in one or more fatalities and/or three or more hospitalized individuals. The 8-hour notification of OSHA is also required if a fatality or hospitalization of three individuals occurs within 30 days after the event.

The Director, EHS Services, has the responsibility for making the OSHA notification. The senior site EHS representative shall make the notification if the Director, EHS Services is unavailable.

The Project Manager is responsible for notifying the client of any required OSHA notifications.

3.5.2 Agency Notifications for Spills, Releases, and Permit Exceedences

It is the Company's policy that if a spill, release, or permit exceedence is determined to be reportable, the Company or the client shall perform the reporting in a timely fashion as defined by federal, state, or local laws and regulations. Notifications shall be made per contract requirements or the project Communications Plan. Prior to initiation of project field activities, the Project Manager shall coordinate with the client to determine the appropriate agency notification responsibilities and procedures. During the conduct of project activities, the client shall be notified regarding the spill, release, or permit exceedence and the Company's notification determination.

The Project Manager, in conjunction with the PESM must determine whether a spill, release, or permit exceedence exceeds reportable quantities to a regulatory agency under federal, state, and/or local laws and regulations or permit conditions. This determination must be made quickly because many laws and regulations require that notifications be made within short time frames (immediately upon knowledge, but no later than 24 hours).

If a spill or release is determined <u>not</u> to exceed reportable quantities, the PESM shall evaluate whether the spill or release poses a threat to human health (for example, has or may release into known drinking water sources, has or may cause contamination of surface soils/materials/air accessible to the public, and so forth). If a spill or release is determined to pose a threat to human health, the Project Manager, with the assistance of the Director, EHS Services, as necessary, shall consult with the client to determine whether the spill or release should be reported to a regulatory agency.

3.6 Documentation

A copy of each Event Report shall be retrievable for the project or office files. The Event Report database may serve this purpose.

3.6.1 Documentation of Agency and Client Notifications

All agency and client notifications shall be documented on the **Event** Report form. Other documentation generated regarding verbal or written agency notifications (if required), including agency response to such notification, shall either be maintained in the project file or preferably, attached to the Event Report.

In instances where the client conducts the reporting, documentation shall be obtained from the client indicating that the agency was notified in accordance with federal, state, or local regulations and maintained in the project files. If the client verbally notifies the Company that the notification was made, the Project Manager shall document the conversation. In these cases, communications shall be recorded internally in accordance with EHS 1-10, External Regulatory Inspections and Notifications, for Environmental Management System reporting requirements.

If the spill, release, or permit exceedence is determined not to be reportable, the Event Report and Investigation shall include the rationale for not reporting the spill, release, or permit exceedence to a regulatory agency.

3.7 Training

The Director, EHS Services, and the Director, Quality Services, have the responsibility for ensuring that site and office supervisory personnel have the appropriate training to conduct event investigations.

ESSs shall be trained on a project-specific basis by the PESM to implement the spill/release and permit exceedence reporting requirements in conjunction with training on the requirements of the project-specific EHS Plans per Corporate Reference Library procedure EHS 3-2, Procedures—Environmental, Health & Safety Plan(s).

Personnel serving in a project or office supervision, or office supervision, ESQ position shall have completed and passed the Company provided self-study course entitled "Practical Loss Control Leadership within 3 months of initial assignment."



4.0 GUIDANCE

4.1 Definitions

4.1.1 Event

For the purposes of this program, an event is:

- a. An injury or illness that meets the OSHA recordability criteria
- b. Ergonomic-related pain complaints
- c. An exposure to a hazardous substance above the allowable exposure unit.
- d. A property/vehicle/equipment/heavy equipment/truck/passenger damage case that results in damage greater than \$500.
- e. A fire or explosion.
- f. A spill or release resulting from the Company, or subcontractor activities, including spills or releases from operations at a client facility of which Company employees have become aware.
- g. Discovery of chemicals or waste products in an office.
- h. A permit exceedance.
- i. Safety-related events reported by an enforcing authority (ISO 14001 Registrar requirement).
- j. Customer, or enforcing authority, complaints regarding the implementation of the Company's EMS or Quality Management

System (QMS).

- k. External regulatory inspections that result in findings or citations.
- I. Quality events as defined in Section 4.1.3.
- m. Near-miss occurrences, as defined in Section 4.1.2 below¹

4.1.2 Near Miss

A "near miss" is an event, that has a reasonable probability in resulting in one of the outcomes described above if the circumstances were different and for which modifications to management programs will reduce the probability of occurrence or the severity of the outcome (see examples of Immediate and Basic causes in Attachment A.

4.1.3 Quality Event

QERs should be generated for the following two situations:

- a. When project quality deficiency reports identify a **significant condition adverse to quality**. A significant condition adverse to quality is one that, if uncorrected, could have a serious adverse effect on operability, level of quality, or presents a high loss potential.
- b. When an event reveals an opportunity for improved performance through modification of our management system.

4.1.4 Recognition and EMS Communication

ZIP Slips (See PP-10, Employee Recognition Programs) may be used to document employee recognition for a job well done, suggestions for improvement, or minor safety issues that should be resolved.

ZIP Slips may be used to document external inquires or complaints regarding the Company's EMS or project-specific environmental aspects.

4.2 Continuous Improvement

TtEC's event investigation procedure and event report database is a tool used by the (ESQ) organization for continuous improvement by:

- · Identifying the root causes of each event
- Tracking and trending
- Selecting appropriate corrective action(s), and person(s) responsible for corrections
- Providing Lessons Learned
- Identifying additional EHS orientation and training topics
- Identifying future health and safety goals and objectives

Corporate ESQ management periodically disseminates valuable information contained in the event/investigation program, company wide to employees in the form of ZIP Bulletins, Flash Reports, and Lessons Learned.

The EMS Coordinator should also review the Event Report database to identify trends and incorporate results into the continuous improvement of the EMS.

4.3 Cause Analysis

4.3.1 Immediate Cause

Determine the immediate causes, using the examples on the form. If one or more of the examples fits the circumstance, use those words in the cause description. Explain, e.g., Improper Lifting – employee attempted to lift box by bending at the waist and twisting while lifting. Be sure that the event description is sufficiently detailed to support the causal analysis in this section. An assumption of cause (e.g., improper lifting) from the injury (low back pain) is not acceptable.

4.3.2 Basic Cause

Like the Immediate Causes, use the guidewords on the form whenever appropriate and explain. For example, improper motivation may be because the correct way takes more time or effort; short cutting standard procedure is tolerated or positively reinforced; or the person thinks there is no personal benefit to always doing the job correctly.

Investigators should determine if a change in the work conditions, scope, methods or personnel contributed to the event. This may occur due to inadequate assessment of hazard potential or inadequate application of hazard controls. If "Change" was contributing, it will most likely be identified in combination with other basic causes.

Note: The investigator is encouraged to review the <u>Practical Loss Control Leadership</u> chapters on *Causes and Effects of Loss* and *Accident/Event Investigation* before doing the causal analysis. The investigation team should refer to the S.C.A.T. Chart

available from the PESM when analyzing causes of high loss potential events, especially where motivation is suspected of being a Basic Cause.

4.3.3 Remedial Actions

Include all actions taken or those that should be taken to *prevent recurrence*. Be sure that actions address the causes. For example, training (safety meetings) may be a necessary response for lack of knowledge, but may be inadequate for improper motivation.

4.4 Loss Control Leadership for Non-Supervisory Personnel

All non-supervisory and non-ESQ positions (excluding craft workers) assigned to conduct field activities should complete the Practical Loss Control Leadership self-study course within one year of initial assignment.



5.0 REFERENCES

Please Describe your Reference Here	Place Your Link in this Column
1. OSHA 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals	
2. EHS 1-10, External Regulatory Inspections and Notifications	G
3. EHS 2-1, Emergency Preparedness	a
4. EHS 3-2, Procedures - Environmental, Health & Safety Plan(s)	G
5. Environmental Management System	a
6. HSG 2-7, Risk Prioritization	a
7. PP-10, Employee Recognition	
8.	
9.	



6.0_ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
Attachment A - Event/Near Miss Report and Investigation	EHS 1-7, Att A, 2007.doc
2. Attachment B - Quality Event Report Form	EHS 1-7, Att B, 2007.doc
3. Attachment C -Event Sketch	EHS 1-7, Att C, 2007.doc

Tetra Tech EC, Inc.

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EHS 1-7, Attachment A Event/Near Miss Report and Investigation

Checkboxes can be toggled on \boxtimes and off \square to show an "X" or not show an "X." Double-click on the box to activate a dialog box that shows possible selections. To preserve formatting when you cut and paste text, use the "paste special" command to paste: EDIT, PASTE SPECIAL, UNFORMATTED TEXT.

Guidance for filling out this form is provided in CRL Procedure EHS 1-7

Section 1, General Information					
Short Description/Title Below: (limited to 125 characters). This is the description that will appear in the database listing.					
,, p					
Type of Event/Near Miss (check all that apply):					
Was a person injured or made ill:					
☐ By something at work ☐ By something outside the work environment ☐ No injury or illness					
Did this event occur in one of our major offices? ☐ Yes ☐ No List Office:					
Did this event occur in a foreign country? ☐ Yes ☐ No					
Did this event involve:					
A strain? ☐ Yes ☐ No Fire? ☐ Yes ☐ No					
A motor vehicle accident? ☐ Yes ☐ No Property damage (>\$500)? ☐ Yes ☐ No					
A repetitive motion injury? ☐ Yes ☐ No Spill/release? ☐ Yes ☐ No					
A fall? ☐ Yes ☐ No Permit exceedence? ☐ Yes ☐ No					
Being struck by something? Yes No					
Event Information					
Case #: Workers Comp #:					
Where did the event occur? Project # (4 digits):					
Site/Location Name: Delivery Order #'s:	elivery Order #'s:				
Date of event: Military time:					
TtEC Supervisor on duty: Was Supervisor at event scene? ☐ Yes ☐ No					
Event Location:					
What employee/employer category was involved in this event?					
☐ TtEC craft/temp service					
☐ Subcontractor					
☐ Other					
Employer of affected employee?					
Weather conditions: Adequate Lighting at Scene? ☐ Yes ☐ No					
What was the employee doing, or what was happening, just before the event occurred? Describe the activity					
below, as well as the tools, equipment, or material the employee was using. Be specific. For example, "climbing a					
ladder while carrying roofing materials," "spraying chlorine from hand sprayer," or "daily computer key-entry."					

What happened? What was the conta example, "When the ladder slipped on gasket broke during replacement," or v	the wet floor, the w	vorker fell 20 feet," "worke	r was sprayed with chlorine when
Section 2, Affected Employee Information	on		
Include injured person, driver/operator, or e created for each injured employee.	employee whose ac	ctivities resulted in the eve	nt. A new event report must be
Employee's name:		Sex 🗌 Male 🗌 Female	
Date of Hire:	Job classification	:	Number of months at TtEC:
Work hours on shift prior to event:		Years in job classification	n (##):
Did event relate to routine task for job class	sification? Yes	□ No	
Section 3, Injury/Illness Information (If n	ot applicable, che	eck here \square and go to Se	ction 4)
Nature of injury of illness: Describe body por "sore." For example, "strained back."	art affected and how	w it was affected below. Be	e more specific than "hurt," "pain,"
What object or substance directly harmed question does not apply to the event, leave		example, "concrete floor,"	"chlorine," "radial arm saw." If this
Was First Aid provided? ☐ Yes ☐ No			
Did the injury/illness result in ☐ Days awa	y (with or without re	estricted days) 🗌 Restricte	ed days only 🗌 No or unknown
Did employee die? ☐ Yes ☐No			
Medical treatment does not include examin First Aid. Attach treatment report/doctor's r			
Was medical treatment provided? ☐ Yes [•		
Section 4, Vehicle and Property Damage	Information (If no	ot applicable, check here	and go to Section 5)
Damaged vehicle make:		Damaged vehicle model:	:
Damaged vehicle VIN:		Vehicle owner:	
Property damaged:			
Describe property damage:			

Section 5, Environmental Release (If not applicable, che	ck here 🗌 and go to Section 6	5)		
Environmental Release				
Substance spilled or released:				
From where:	To where:			
Estimated quantity/duration:	CERCLA Hazardous substan	ce? 🗌 Yes 🗌 No		
RQ exceeded? ☐ Yes ☐ No	Specify RQ:			
Reportable to agency? Yes No	Specify (place telecom in project file):			
Responsibility to report: TtEC Client Other	Time frame:			
Written report (place report in project file): ☐ Yes ☐ No				
Response action taken:				
Permit Exceedence				
Type of permit:	Permit #:			
Date of exceedence:	Parameter(s):			
Criteria:	Exceedence levels:			
Exceedence duration:	Reportable to agency: Yes	s 🗌 No		
Specify (place telecom in project file):				
Time frame:				
Response action taken:				
Section 6, Notifications				
Insert names of TtEC personnel notified below:				
Name:	Date:	Time:		
Name:	Date:	Time:		
Name:	Date:	Time:		
Name:	Date:	Time:		
Client rep notified:	Date:	Time:		
By whom:	•	•		
Agency notified:	Date:	Time:		
By whom:	•	•		
Agency Contact Name:				
Section 7, Persons Preparing Report				
Signature of this form verifies that all supplied information is accurate.				
Employee's name (print):	Sign:			
Employee's name (print):	Sign:			
Supervisor's name (print): Sign:				
Supervisor's phone number:				
Date:				
Note to supervisor. Supervisor is to forward a copy of the Eventher personnel as identified in Table 1 of this procedure AS		isor, PESM, ESS or ESC, and		

Section 8, Attach Sketches or Photos					
Report Number:					
Send sketch by mail, fax, or attach an electronic file. EHS 1-7, Attachment C, contains a template that can be used for creating sketches of accidents.					
Vehicle Events					
BMP files (JPG file sizes are typically sm	Write in the street names and, if possible, the points of the compass. Attach black-and-white hard-copy photos or JPG or BMP files (JPG file sizes are typically smaller) as appropriate. If the sketch appears on a police report or insurance form, this need not be completed. Attach the other report or send a hard copy to the Director, EHS Services.				
Section 9, Investigative Report					
Date Information:					
Date of event:		Date of investigative	e report:		
Event Cost:					
Other event costs: \$	WC claim value: \$		Estimated loss: \$		
Cause Analysis					
Was the activity addressed in an AHA? [☐ Yes (attach applica	able section) 🗌 No			
Immediate Causes					
What actions and conditions contributed	to this event? Check	all that apply:			
	Substand	dard Acts			
☐ Operating equipment without authorit	у	☐ Horseplay			
☐ Failure to warn		☐ Using equipment improperly			
☐ Failure to secure		☐ Failure to follow	procedure		
☐ Operating at improper speed		☐ Personnel not p	roperly qualified		
☐ Making safety devices inoperable		☐ Failure to comm	unicate		
☐ Removing safety devices			ment outside of specified parameters		
☐ Using defective equipment		☐ Failure to check	equipment prior to acceptance		
☐ Failure to use PPE properly		☐ Acceptance of d	efective equipment		
☐ Improper loading		☐ Failure to provid	e proper equipment		
☐ Improper placement		☐ Improper servicing/maintenance of equipment			
☐ Improper lifting		☐ Other substandard acts			
☐ Improper position for task		☐ Servicing equipment in operation			
Under influence of alcohol/drugs					
Substandard Conditions					
Guards or barriers		Exposure to hazardous materials			
☐ Protective equipment		☐ Extreme temperature exposure			
☐ Tools/equipment or materials		☐ Illumination			
Congestion		☐ Ventilation			
☐ Warning system		☐ Visibility			
Fire and explosion hazards		Radiation			
Poor housekeeping		Hazardous environmental conditions			
☐ Noise exposure		☐ Other substandard conditions			

Enter brief explanation of each <i>immediate cause</i> below:				
Basic Causes				
What specific personal or job factors contributed to this even	t? Check all that apply:			
Personal Factors	Job Factors			
☐ Inadequate physical/physiological capability	☐ Inadequate leadership and/or supervision			
☐ Inadequate mental/psychological capability	☐ Inadequate engineering			
☐ Physical or physiological stress	☐ Inadequate purchasing			
☐ Lack of knowledge	☐ Inadequate maintenance			
☐ Lack of skill	☐ Inadequate tools and equipment			
☐ Improper motivation	☐ Inadequate work standards			
☐ Other personal factors	☐ Excessive wear and tear			
	☐ Abuse and misuse			
	☐ Change			
	☐ Other job factors			
Enter brief explanation of each <i>basic cause</i> below:				
Section 10, Action Plan				
What has or should be done to control each of the causes lis	ted? Consider the following Management Programs in			
developing remedial actions:				
☐ Leadership and administration	☐ Health control			
☐ Training	☐ System evaluation			
☐ Planned inspections	☐ Engineering controls and change management			
☐ Task analysis and procedures	☐ Personal communications			
☐ Task observation	☐ Group meetings			
☐ Emergency preparedness	☐ General promotion			
☐ Rules and work permits	☐ Hiring and placement			
☐ Accident/event analysis and corrective and preventive act	ion			
☐ Personal protective equipment				

Remedial Actions				
Actions	Person Responsible		Target Date	Completion Date
1.	1.			
2.	2.			
3.	3.			
4.	4.			
Section 11, Persons Performing Investigation				
Investigator's name:		I	Date:	
Investigator's name:		1	Date:	
Investigator's name:		1	Date:	
Management Review				
Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.				
Project/Office Manager Approval: ☐ Yes ☐ No				
Comments:				
Sign:		Date of	Approval:	
ESQ (PESM) Approval: Yes No				
Comments:				
Sign:		Date of	Approval:	
Note: Attach additional information as necessary. Super Manager or ESQ as soon as possible, but no later than Services, within 24 hours of completion of the report.	n 72 hours after the eve			

EHS 1-7, Attachment B Quality Event Report and Investigation

Checkboxes can be toggled on \boxtimes and off \square to show an "X." or not show an "X." Double-click on the box to activate a dialog box that shows possible selections. To preserve formatting when you cut and paste text, use the "paste special" command to paste: EDIT, PASTE SPECIAL, UNFORMATTED TEXT.

Guidance for filling out this form is provided in CRL Procedure EHS 1-7.

	р					
Section 1, Event Descr	Section 1, Event Description and Investigation					
Date of event:						
Office/Project Location: Organization or Department:				Department:		
Means of identification:						
☐ Client concern	☐ Nonconform	nance report	☐ Au	ıdit report	☐ Corrective action request	
☐ Supervisory review	☐ Peer review	1	☐ Pro	oject review	Other (describe):	
Enter Short Description listing.	n/Title (limited to	o 125 characte	ers) bel	low. This is the	description that will appear in the database	
Issue Summary: Summ their role (e.g., performe	Issue Summary: Summarize the concern, problem, or situation that needs to be addressed. Identify who was involved and their role (e.g., performer, inspector, auditor).					
Section 2, Persons Pre	paring Report					
Signature of this form ve	rifies that all sup	plied information	on is ac	curate.		
Employee's name (print)	:			Sign:		
Employee's name (print):				Sign:		
Supervisor's name (print):			Sign:			
Supervisor's phone num	ber:					
Date:						
Note to supervisor. Superother personnel as ident					ediate supervisor, PESM, ESS or ESC, and an 24 hours.	
Section 3, Investigative	Report					
Date of investigative rep	ort:					
Other event costs: \$		WC claim valu	ue: \$		Estimated loss: \$	
Cause Analysis						
Immediate Causes						
What actions and condit	ions contributed	to this event? (Check a	all that apply:		
Substandard Acts						
☐ Operating equipment without authority				☐ Inadequate inspection/peer review		
☐ Failure to follow/improper execution of procedure				☐ Poor judgment		
☐ Using equipment improperly				☐ Failure to communicate—written and/or verbal		
Improper servicing/maintenance of equipment				☐ Acceptance of defective equipment/material		
Under influence of alcohol/drugs				☐ Other substandard acts		
Horseplay						

EHS 1-7, Attachment B Quality Event Report and Investigation

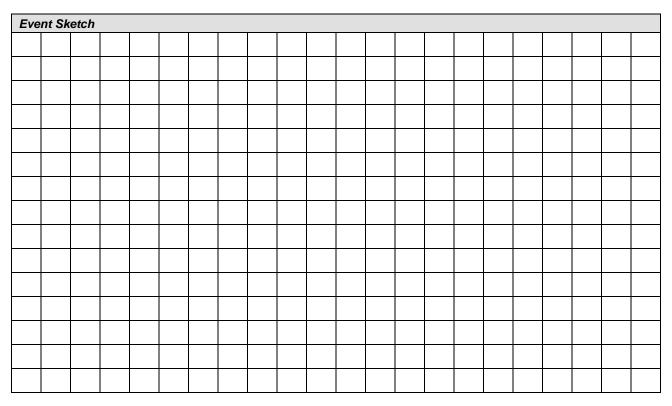
Substandard Conditions			
☐ Personnel not properly qualified or trained	☐ Inadequate oversight		
☐ Defective equipment/material	☐ Inadequate procedure/instruction		
Enter brief explanation of each <i>immediate cause</i> below:			
Basic Causes			
What specific personal or job management system factors co	ontributed to this event? Check all that apply:		
Personal Factors	Job Factors		
☐ Inadequate physical/physiological capability	☐ Inadequate leadership and/or supervision		
☐ Inadequate mental/psychological capability	☐ Inadequate engineering		
☐ Physical or physiological stress	☐ Inadequate purchasing		
☐ Lack of knowledge	☐ Inadequate maintenance		
☐ Lack of skill	☐ Inadequate tools and equipment		
☐ Improper motivation	☐ Inadequate work standards		
☐ Other personal factors	☐ Excessive wear and tear		
	☐ Abuse and misuse		
	☐ Change		
	☐ Other job factors		
Enter brief explanation of each <i>basic cause</i> below:			
Section 4, Action Plan			
What has or should be done to control each of the causes lis	ted? Consider the following Management Programs in		
developing remedial actions:			
Leadership and administration	☐ Engineering controls and change management		
☐ Training	☐ Personal communications		
☐ Planned inspections	☐ Group meetings		
☐ Critical task analysis and procedures	☐ General promotion of Loss Control principles		
☐ Task observation	☐ Hiring and placement		
Rules and work permits	☐ Materials and services management		
☐ Accident/event analysis and corrective and preventive act	ion Quality control		
☐ System evaluation			

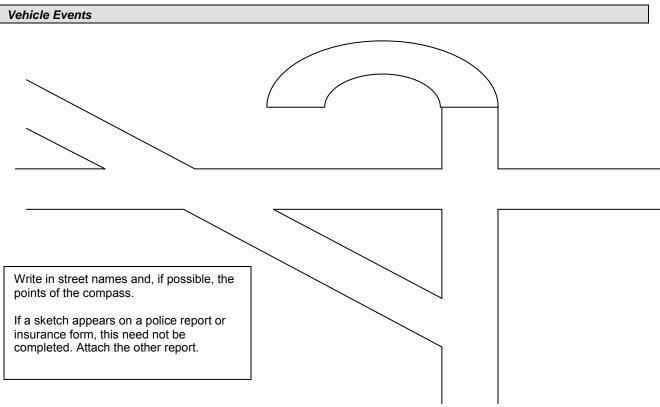
EHS 1-7, Attachment B Quality Event Report and Investigation

Remedial Actions					
Actions	Person Responsible)	Target Date	Completion Date	
1.	1.				
2.	2.				
3.	3.				
4.	4.				
Section 5, Persons Performing Investigation					
Investigator's name:	Investigator's name:		Date:		
Investigator's name:	!		te:		
Investigator's name:		Dat	e:		
Management Review					
Note: Signature verifies that all supplied information is accurate; the description supports the causal analysis; and the Action Plan is sufficient to address the causes.					
Project/Office Manager Approval: Yes No					
Comments:					
Sign:	Dat	e of App	oroval:		
ESQ (PESM, QA) Approval: Yes No					
Comments:					
Sign:	Dat	e of App	oroval:		
Note: Attach additional information as necessary. Supervisor to forward copy of Investigative Report to the PM or Office Manager or ESQ as soon as possible, but no later than 72 hours after the event. A copy shall be sent to the Director, EHS Services, within 24 hours of completion of the report. Attach here.					

EHS 1-7, Attachment C Event/Near Miss Report and Investigation Sketch Template and Instructions

Event/Near Miss Report and Investigation Sketch Template





EHS 1-9: Recordkeeping

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 10/03/2005

Purpose: The purpose of the environmental, health and safety (EHS) recordkeeping program is to ensure that all primary EHS records

are maintained in a consistent manner that meet applicable laws and regulations, company objectives, and contract requirements, and to have an easily retrievable record of EHS project activities. This program also describes the types of

Skip Parry

centralized and project EHS records maintained by Tetra Tech EC, Inc. ("the Company").

Version Date:

10/13/2005 - Revised **Original Issue Date:** 02/01/95

Category: Company Procedures Sections: ESQ - Environmental Health & Safety Programs

Sub Category: Departmental/Discipline **Document Type:** Procedure

Keyword Field Activities/Environmental Document Owner: Index:

H&S, Field Activities/Environmental H&S, EHS Compliance/Waste Management, EHS Compliance/Permits, Field

Activities/Science

Approved By:

Table of Contents

See Below

1.0 PURPOSE

The purpose of the environmental, health and safety (EHS) recordkeeping program is to ensure that all primary EHS records are maintained in a consistent manner that meet applicable laws and regulations, company objectives, and contract requirements, and to have an easily retrievable record of EHS project activities. This program also describes the types of centralized and project EHS records maintained by Tetra Tech EC, Inc. ("the Company").

2.0 SCOPE

This program applies to all Company office and project locations which generate, receive, or store EHS records.

3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 EHS Personnel

The Project Environmental and Safety Manager (PESM) is responsible for providing oversight of office/project recordkeeping activities.

Office Environmental and Safety Coordinators (ESC) and Environmental and Safety Supervisors (ESS) are responsible for:

- a. Managing the incident records for each office/project, for coordinating with the Director, EHS Services
- b. Ensuring the employee EHS training and certification records are complete and up-to-date
- c. Ensuring that complete and accurate office/project EHS records are generated and maintained
- d. The ESS is also responsible for forwarding project EHS records to the responsible person for project closeout.

3.1.2 Director, EHS Services

Director, <u>EHS Services</u> is responsible for managing employee EHS training program documentation, EHS training and certification records, and employee medical records.

3.2 Employee EHS Training and Certification Records

Employee EHS Training and Certification Records will contain the records listed below.

- a. Medical Qualification The Company Certification for Hazardous Waste Work and Respirator Use per the Company Medical Surveillance Program, CRL Procedure EHS 4-5.
- b. Training Records Training records consist of documentation that an employee has completed required EHS training in accordance with CRL Procedure EHS 1-11, Training.

Documentation of EHS training that is specific to one site or project, and is not intended to qualify an employee to conduct similar tasks at other work locations will only be kept in the project EHS records.

3.3 Employee Medical Record

The employee medical record will contain records as defined in EHS 4-5, Medical Surveillance. The <u>Corporate Medical Consultant (CMC)</u> maintains employee medical records in a centralized location. The CMC will ensure that confidentiality is maintained, records are maintained in a safe and secure facility, and <u>the Company</u> and its employee can access the medical records in a timely manner.

3.4 Project EHS Records

Project EHS records are part of the overall project records and will be maintained in accordance with CRL Procedure PO-8, Document Control. Project EHS records will be maintained for each Company project where employee EHS information is generated or required and where environmental or health and safety laws and regulations require maintenance of such documents.

The Project EHS record will contain the following information as applicable.

- a. EHS Correspondence Any EHS correspondence including memorandum, letters, incident reports, internal or external audit or inspection reports, faxes, written phone conversation summaries, and similar documentation.
- b. Project EHS Plans Signed copies of the project EHS plan as required by CRL Procedure EHS 3-2, EHS Plans, along with any associated field change requests or addenda.
- c. Project Health and Safety Log Books Original project health and safety log books (or copies of the log books if the originals must be maintained in another file or delivered to the client).
- d. Weekly EHS Report Original weekly EHS reports for projects when required by the Project Environmental and Safety Manager (PESM).
- e. Exposure Sampling and Monitoring Records A complete copy of documentation related to personal exposure sampling (air sampling/calibration data sheet, laboratory report, calculation sheets, and sampling report if generated) and any other real time (including OVA, HNu, CGI, etc.), detector tube, noise dosimeter, <u>radiological area monitoring</u> or other sampling or monitoring performed. See CRL Procedure EHS 4-3, Radioactive and Mixed Waste Program, for <u>additional</u> guidance on the maintenance of <u>radiological records, including personnel dosimetry</u>.
- f. EHS Compliance Documentation All documents required by environmental or safety and health laws and regulations and the Company EMS program. These documents may include, but not limited to, decision documents, permits, approvals, agency correspondence, monitoring and waste analysis data, manifests/shipping papers, reports, notifications, training records, certifications/licenses, and the OSHA 300 log.
- g. Closeout EHS Report Any closeout EHS report generated for a project.
- h. Other Patent Information Other information generated or available which may contain information concerning potential employee exposure to physical or chemical agents.

Other pertinent records would include fit-test results conducted at the site, confined space or hot work permits, trench or excavation inspection forms, site safety briefing records, subcontractor safety submittals, worker medical data sheets, and site-specific training records for hazard communication, confined space, or materials handling.

3.5 Injury and Illness Records

- a. The <u>Company</u> Incident and Investigation Reports The use, maintenance, and procedures for completion of the Company Incident and Investigation Reports are covered in the CRL Procedure EHS 1-7 Incident Reporting and Investigation Program. The Company Incident and Investigation Report is an acceptable alternative to the OSHA 301 Report.
- b. OSHA Recordkeeping The Director EHS Services shall maintain the Company OSHA 300 log and shall be the source of: 1) each site/office OSHA log, and 2) the annual OSHA 300A Summary reports for each site/office.
- c. An OSHA 300 log will be maintained for each office and for each office and for each field project location where work will be performed for three months duration or longer. For field project locations where work will be performed for less than 3 months, the OSHA 300 log of the affected employee home office (or the home office of the department manager for field pool employees) will be used to document any applicable injuries or illnesses, unless otherwise directed by the Director EHS Services.
- d. The ESS or ESC (or when not assigned, the senior line manager) shall ensure an OSHA 300 log is present and maintained on site or in the office.

The OSHA 300 log is required to be physically present on site or in the office only when a recordable injury or illness has occurred at that site or office during the project time or previous 6 years, whichever is shorter.

When no injury or illness has occurred, the Company OSHA 300 log maintained by the Director EHS Services is sufficient.

- e. The OSHA 300 log shall be updated as soon as practicable, but no later than seven calendar days after receiving information that a recordable injury or illness has occurred.
- f. <u>The OSHA 300A Summary</u> totals and certification will be completed by January 15 each year. The OSHA <u>300A Summary</u> will be posted in the workplace (office or active field location) from February 1 to <u>April 30</u> of each year. If no injuries or illnesses were recorded during the year, zeros will be entered on the totals line, and the form posted as required. The OSHA <u>300A Summary</u> will be retained in each office and active field location for six years following posting.

3.6 EHS Training Program Record

EHS Training Program records will be maintained in a centralized file. This file will be maintained by Director, EHS Services and will be retrievable by training date and type of training.

Personnel arranging for or providing EHS <u>program</u> training are responsible for sending copies of training course documentation to the Director, EHS <u>Services</u> per CRL Procedure EHS 1-11, Training.

3.7 Access to Employee Exposure and Medical Records

Access to employee exposure and medical records shall meet the requirements of 29 CFR 1910.20 or other applicable state standards. Requirements of this section will not supersede any existing legal or ethical obligations regarding medical record confidentiality, duty to disclose information, or related patient/employee relationship.

Potential employee exposure records and medical records will be provided to an employee or authorized representative within 15 days after a request for access has been made. The Director, EHS Services must be notified of any request for access. Request should be made in writing and dated. Normally, the CMC will reproduce the records and send to the authorized requestor and/or the designated project EHS record coordinator.

3.8 Storage and Archiving of EHS Records

Procedures for storing and archiving EHS records are defined in PO-8, Document Control.

3.9 Training

OSHA requires that employees be provided with certain information regarding access to employee exposure and medical records per 1910.1020. Employees shall-be notified of: 1) the existence, location, and availability of any records covered by 1910.1020; 2) the person(s) responsible for maintaining and providing access to records; and 3) each employee's rights of access to these records. This information shall be in accordance with the requirements of this program. The Director, EHS-Services shall provide this information to all Company employees each year. This information shall also be provided to new employees as part of initial orientation.

There are no formal training requirements associated with the other aspects of this program.

4.0 GUIDELINES

4.1 Definitions

4.1.1 Employee EHS Training and Certification Records

Employee EHS training and medical certificates that are maintained in a central location by the Director, EHS Services.

4.1.2 Employee Medical Records

Documentation of any medical testing or evaluation of an employee's health status, e.g. laboratory results, x-rays, audiograms, pulmonary function test results, biological monitoring or bioassay results, and physician evaluation reports that are maintained in a central location by the Corporate Medical Consultant (CMC).

4.1.3 Project EHS Records

Project EHS records include site-specific training records, and certificates, log books, periodic reports and summaries, employee exposure records, pertinent sampling results, meeting records, documentation of disciplinary actions related to EHS, and all required environmental compliance decisions, approvals, permits, plans and correspondence, that are maintained as part of the project records

4.1.4 Incident Records

Documentation of all incident and investigation reports including injuries and illnesses, spills and releases, permit exceedences, OSHA logs, and employees first report of injury that are required by CRL Procedure EHS 1-7, Incident Reporting and Investigation.

4.1.5 EHS Training Program Documentation

Training records including training course curriculum, attendance rosters, and course materials such as copies of overheads, handouts, and performance tests that are maintained in a central location by the Director, ESQ Programs.

5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
1. 29 CFR 1910.120, Access to Employee Exposure and Medical Records	
2. EHS 1-7, Incident Reporting and Investigation	Q
3. EHS 1-11, Training	۵
4. EHS 3-2, Procedures - Environmental, Health & Safety Plan(s)	
5. PO-8, Document Control	O
6. OSHA (U.S. Department of Labor, Occupational Safety and Health (Administration)	
7.	
8.	
9.	
10.	

6.0 ATTACHMENTS

None

Tetra Tech EC, Inc.

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EHS 3-1: Ergonomics Page 1 of 7

EHS 3-1: Ergonomics

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 05/20/2002

ESQ - Environmental Health & Safety Programs

The purpose of this program is to establish minimum requirements for the implementation of an effective ergonomics program Purpose:

at Tetra Tech EC, Inc. (TtEC). The program is focused on the prevention of cumulative trauma disorders, particularly those

associated with the use of computer keyboards and injuries associated with lifting and material handling.

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1.0 PURPOSE

The purpose of this program is to establish minimum requirements for the implementation of an effective ergonomics program at

Tetra Tech EC, Inc. (TtEC). The program is focused on the prevention of cumulative trauma disorders, particularly those associated with the use of computer keyboards and injuries associated with lifting and material handling.



2.0 SCOPE

This program applies to all TtEC operations.



3.0 MAINTENANCE

The Executive Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Ergonomics

The science that studies the physical effects of workstations, tools, and equipment on the human body.



4.2 Cumulative Trauma Disorder

A term for health disorders arising from repeated biomechanical stress due to ergonomic hazards. Other terms used include: repetitive motion injury, occupational overuse syndrome, and repetitive strain injury. Cumulative trauma disorders (CTDs) are a class of musculoskeletal disorders involving damage to the tendons, tendon sheaths, synovial lubrication of the tendon sheaths, and the related bones, muscles, and nerves of the hands, wrists, elbows, shoulders, neck and back. Frequently occurring CTDs include: carpel tunnel syndrome, epicondylitis (tennis elbow), tendinitis, tenosynovitis, synovitis, stenosing tenosynovitis of the fingers, DeQuervain's Disease, and low back pain.



4.3 Ergonomic Hazard

A workplace condition that poses a biomechanical stress to the worker. They include, but are not limited to: faulty work station layout, improper work methods, improper tools, excessive tool vibration, and job design problems that include aspects of work flow, posture, work/rest regimens, and repetition rate.



4.4 Ergonomic Risk Factor

A condition of a job or activity that contributes to the risk of developing CTDs. Examples include: repetitiveness of activity, force required, and awkwardness of posture. They are considered in light of their combined effect in inducing CTDs, i.e., risk factors are synergistic element of ergonomic hazards.



4.5 Health Care Provider/Medical Surveillance Program Administrator

A physician/physicians specializing in occupational health, registered nurse specializing in occupational health, or other health personnel working under the supervision of these individuals.



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4.6 Qualified Person

A person with thorough training and experience sufficient to identify ergonomic hazards in the workplace and recommend an effective means of correction.



4.7 Systems Approach

A comprehensive program that addresses workplace processes, activities and conditions as interdependent systems in order to identify and to eliminate or reduce all types of hazard, including ergonomic hazards, to employees.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Line Management

Line managers are responsible for:

- reviewing and <u>implementing</u> health and safety recommendations which are intended to reduce the probability that ergonomic disorders will occur.
- contacting ESQ to perform an office ergonomic survey when:
 - a new employee is hired
 - an employee moves to another workstation
 - an employee obtains new furniture
 - an employee's assignment changes that significantly increases their computer use
 - an employee informs their supervisor that they are experiencing symptoms which may be associated with their workstation
- ensuring office-based employees receive ergonomic awareness training, conduct workstation self-assessments, and report any physical discomfort or problems with their workstation immediately.



5.1.2 Environmental, Health and Safety Personnel

The Environmental and Safety Coordinator (ESC) for each office or the Environmental and Safety Supervisor (ESS) for each project is responsible for surveying each workplace per the requirements of this programs, to identify ergonomic hazards and to make recommendations, when necessary, for corrective actions to reduce the probability that ergonomic disorders will occur.

The ESC shall also respond to employee or supervisory requests for an ergonomic survey.



5.2 Pre-Placement Medical Evaluations

Pre-placement medical evaluations are not required for office personnel.

TtEC job descriptions contain general information regarding the physical exertion required for each job position including standing, walking, bending, climbing, and lifting. For participants in the TtEC medical surveillance program (hazardous waste workers), per EHS 4-5, Medical Surveillance, this information will assist the Corporate Medical Consultant (CMC) to evaluate an individual's ability to perform the job tasks required by their job position. The objective of this evaluation is to identify pre-existing physical conditions which might be aggravated by routine job duties. The results of the medical evaluation will enable Human Resources and operations personnel to determine when reasonable accommodations can be made to avoid aggravation of pre-existing ergonomic disorders or conditions.

Pre-employment back evaluations are recommended for craft workers who may be at greater risk of developing low back pain or low back injury. This evaluation may be requested by contacting our Corporate Medical Consultant (CMC) and may be performed by the local medical provider under the approval and direction of our CMC.



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5.3 Workplace Evaluations

Surveys shall be performed by qualified persons to identify and evaluate tasks which might result in injuries due to ergonomic hazards. The focus of the surveys will be: 1) Computer workstations which are used by a single person on an average of more than 20 hours per week and those which are used by multiple persons, and 2) Operations which involve the manual lifting and moving of objects of excessive weight or asymmetric size.



5.3.1 Computer Workstation Surveys

Workstation Ergonomic Checklist (Attachment A) shall be used for the evaluation of all computer workstations which are used by a single person on an average of more than 20 hours per week or by multiple persons. This checklist is based on guidelines established in the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations.

If the results of the computer workstation survey indicate that the workstation does not meet the desired characteristics or the workstation is not being properly used, recommendations shall be made to modify the workstation and/or provide additional training.



5.3.2 Material Handling

Potential material handling hazards for field operations will be initially identified during the development of Environmental, Health and Safety (EHS) plans pursuant to EHS 3-2, EHS Plans. Potential hazards are to be addressed through the hazard analysis portions of these plans. The effectiveness of the control measures are to be reviewed during inspections (EHS 3-3, Inspections), ESQ audits (C-2, Audits), and routine observations of workplace activities.

During inspections or audits, or when performing routine observations of workplace activities, Attachment B or an equivalent should be used as a screening tool to identify tasks with ergonomic hazards or risk factors. When ergonomic hazards or risk factors for lifting tasks are identified, the NIOSH "Work Practices Guide for Material Handling" are available as guidelines for evaluating the task.

Recommendations shall be made as necessary to modify the work activity and/or provide additional training. The NIOSH evaluation criteria accounts for the following variables for each lifting task: weight of object, horizontal location, vertical location, vertical travel distance, frequency of lifting, and duration of period of lifting.



5.3.3 Frequency of Workplace Surveys

Computer workstation surveys shall be conducted:

- ergonomic evaluation upon initial assignment, upon a move, upon use or receipt of new furniture/chairs, computers, monitors, (etc). and upon request of an employee, supervisor or office manager.
- for new hires within one month of workstation permanency
- when an employee moves to another workstation
- when an employee obtains new furniture
- when an employee informs their supervisor that they are experiencing symptoms which may be associated with their workstation
- when requested by an employee or his/her supervisor

Material handling surveys will be conducted as part of the TtEC EHS inspection and audit programs, EHS 3-3, Inspections, and C-2, Audits.



5.3.4 Action Items and Follow-up Report

The ESS or ESC shall develop an Action Item and Closure Report (Attachment C or an equivalent) that identifies the recommendations, proposed schedule for implementation and responsible parties. The Operations Manager (for field sites) shall complete and forward the Action Item and Closure Report within 60 days of receipt to the ESS or ESC. The ESS or ESC shall send copies to Manager, EHS Services and to the Director, EHS Services. The ESS or ESC will notify the Operations Manager and manager, EHS Services when Closure Reports are delinquent.



5.3.5 Records

Manager, EHS Services shall maintain copies of all ergonomics surveys and completed Action Item and Closure Reports.



5.4 Hazard Prevention and Control



5.4.1 Workstation Configuration

The recommended design specifications for TtEC work stations are:

- Adequate work space to perform the job;
- Consideration of individual body size in relation to design of chair, height of work surface, and access to various elements of the work station, including the monitor screen;
- Work surface, monitor and keyboard height within parameters established in the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations (ANSI/HFS 100-1988), or preferably, a height adjustable work station (including capability to adjust monitor height and keyboard height if VDT is used);
- Adequate leg room;
- No direct reflection of light on screen, adequate illumination (normally 28-50 footcandles), minimum contrast between a monitor screen and the surrounding work area; and
- Direction of air supply ducts away from person.

The recommendations for chair design are:

- Adjustable seatpan, and lumbar-supportive backrest that can be adjusted for height and depth to individual users;
- five legs;
- adjustable for height;
- laterally and vertically adjustable armrests;
- backrest adjustable for tilt and;
- chair can swivel

Recommendations for miscellaneous workstation accessories include:

 VDT workstations: footrest, <u>natural shaped keyboard</u>, adjustable copy holder, wrist rest, mouse rest, antiglare screen (if needed or wanted).

All newly purchased TtEC workstations, desks, and/or chairs shall meet the above specifications. Existing furniture shall be modified as necessary on the basis of the evaluation using the workstation ergonomic checklist.



5.4.2 Work Practice Controls for Computer Workstations

Work practice controls for workstations include setting the work station up correctly, proper posture, taking eye breaks, and exercises.

The set-up of a VDT workstation should be as follows:

- The center of the screen should be at chin level. Position the screen at 14 to 24 inches from the eyes.
- Adjust the chair to fit body. Keep the back supported, knees at hip level, feet flat on floor or on a footrest.
- Place keyboard low enough so arms hang loosely, shoulders are relaxed, and the upper arm is at a right angle to
 the forearm.
- Set document holder close to screen and at same distance <u>from eyes</u> to avoid frequent head and eye movements and refocusing.
- Every 20 minutes, focus on an object at least 20 feet away. Move eyes up down, sideways, and diagonally.
 Eliminate sources of reflective glare. Correct posture includes holding head and spine upright and sitting well back in the chair aim buttocks where seat and backrest meet.
- Keep wrist in line with hands and forearms. Maintain a light touch on keyboard.
- Allow hand to rest on mouse.
- Support lower arms by using the chair armrests to eliminate need to hold up arms and shoulders.



5.4.3 Material Handling Controls

Material handling equipment such as lift trucks, hand trucks, lift gates, etc. shall be utilized whenever possible.

When mechanical lifting and moving aids cannot be used, team lifting shall be used as a minimum for loads over 50 pounds and

for awkward loads. When team lifting is not indicated, personnel are to be trained in and required to use proper lifting techniques.



5.4.4 Hand Tool Selection

Hand tools shall be selected to minimize the following stressors: chronic muscle contraction or steady force, extreme or awkward finger/hand/arm positions, repetitive forceful motions, excessive gripping, pinching, pressing with hand and fingers.



5.5 Personal Protective Equipment

TtEC shall not provide personal protective equipment (PPE) for reducing ergonomic risk factors without the authorization of the CMC or Manager, EHS Services. This includes, but is not limited to, "back" belts, wrist splints, and forearm wraps for "tennis" elbow.



5.6 Training

The employees identified below and supervisors of such employees shall be trained in accordance with the requirements specified in this section.

- Employees who use a computer workstation on an average of more than 20 hours per week;
- Employees who share work station with multiple persons;
- Employees who conduct operations which involve the manual lifting and moving of objects of excessive weight or asymmetric size; and
- Employees identified through the ergonomic survey as requiring training.

The training shall be geared toward field or office duties, as appropriate. It shall include, but not be limited to:

- Types of ergonomic disorders, especially CTD's and back/upper body strains;
- What risk factors cause or contribute to ergonomic disorders;
- How to recognize and report symptoms;
- Ergonomic hazards associated with their assigned tasks;
- Proper workstation design, use, and posture, if applicable;
- Proper lifting techniques; and
- Work practice controls.
- Summary TtEC Ergonomic program with employees.
- Employees who experience symptoms/pain possibly associated with their workstatioin.

This training shall be conducted as part of office or site-specific orientation.



6.0 REFERENCES

ANSI (American National Standards Institute) Human Factors Engineering of Visual Display Terminal Workstations. Compliance Procedure C-2. Audits

Environmental, Health & Safety - Programs Procedure EHS 3-2, Procedures - Environmental, Health & Safety Plan(s)

Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections

Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance

NIOSH (National Institute for Occupational Safety and Health) Revised Guide for Manual Lifting.

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration) Ergonomics Program Management Guidelines for Meatpacking Plants (1991).

Personal Health Design Bytes of Advice for Comfort and Health, Loudonville, NY (1992).



7.0 ATTACHMENTS

Attachment A - Workstation Ergonomic Checklist

Attachment B - Identification of Ergonomic Risk Factors

Attachment C - Action Item and Closure Report

EHS 3-1 ATTACHMENT A WORKSTATION ERGONOMIC CHECKLIST

Click the icon below to download and complete.



Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 3-1 ATTACHMENT B IDENTIFICATION OF ERGONOMIC RISK FACTORS

Click the icon below to download and complete.



EHS 3-1 Attachment B.doc
Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 3-1 ATTACHMENT C ERGONOMICS ACTION ITEM AND CLOSURE REPORT

Click the icon below to download and complete.



EHS 3-1 Attachment C040301.doc
Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

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EHS 3-3: EHS Inspections

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Nicole Bush on 11/09/2010

ESQ - Environmental Health & Safety Programs

Purpose: The purpose of this procedure is to establish a process for periodic inspections of project sites, offices and warehouses.

Version

11/09/2010 - Revised **Original Issue Date:** 02/01/95

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EHS Compliance/Waste

Management, Field Activities/Environmental H&S,

Training, Monitoring,

Nonconformance and Corrective

and Preventive Action

Approved By:



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See Below

▼1.0 PURPOSE

The purpose of this procedure is to establish a process for periodic inspections of project sites, offices and warehouses.

2.0 SCOPE

This procedure applies to all Tetra Tech EC, Inc. (TtEC) ("the Company") project sites, offices, and warehouses, including subcontractor activities.

₹3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

▼3.1.1 Project Manager

The Project Manager (PM) is responsible for:

- a. Planning and budgeting for inspections as part of the project planning process in accordance with Task Initiation Procedure, PO-2 and the Project's Risk Management Plan.
- b. Ensuring that inspections are conducted in accordance with this procedure.
- c. Reviewing Environmental Health and Safety (EHS) inspection reports with on-site management.

3.1.2 Site Manager

The Site Manager (SM) or PM is responsible for:

- a. Participating in weekly EHS inspections as practicable.
- b. Ensuring that action items are developed, documented, and implemented and tracked to closure.

3.1.3 Site Supervisors

Site Supervisors are responsible for:

- a. Conducting weekly EHS inspections for their area(s) of responsibility.
- b. Ensuring that weekly inspection action items are implemented and documented in the project files.

[™]3.1.4 Operations Manager

The Operations Manager for each office and warehouse is responsible for ensuring that:

- a. Inspections of the office and, if applicable, warehouse are conducted on a quarterly basis.
- b. Action items are implemented and documented in a timely manner.

▼3.1.5 Director, EHS Services

The Director, EHS Services, is responsible for:

- a. Reviewing and updating the inspection checklists as necessary.
- b. Monitoring conformance with the Project Environmental and Safety Manager (PESM) inspection requirements.
- c. Developing Lessons Learned Reports, Event Reports, or ZIP Bulletins for selected inspection findings

▼3.1.6 PESM

The PESM is responsible for:

- a. Approving and documenting PESM inspection frequency.
- b. Performing the PESM inspections and/or designating the appropriate technical specialist, as necessary, per the project schedule and budget.
- c. Immediately communicating significant violations or potential violations to the Project Manager and the Director, EHS Services.
- d. Preparing PESM inspection reports, issuing the report, and posting to the Company PESM inspection Database located on Lotus Notes within 10 days of the inspection.
- e. Tracking closure of each PESM inspection.
- f. Providing training in proper inspection techniques and as required to address action items.
- g. Reviewing EHS inspection reports.

₹3.1.7 ESS

The ESS is responsible for:

- a. Performing informal daily inspections of the worksite and documenting observations in the safety logbook.
- b. Assisting the PM or SM with weekly inspections.
- c. Reviewing the weekly and monthly inspection checklists for completeness, thoroughness, and trends. <u>Trends of action items</u> in weekly and monthly EHS inspection results should be reviewed for similar situations in other areas.

▼3.1.8 Office Environmental and Safety Coordinator

The Office Environmental and Safety Coordinator (ESC) is responsible for:

- a. Assisting with quarterly inspections of the office and, if applicable, the warehouse.
- b. Training alternate office personnel on how to conduct office inspections.

→3.2 Inspection Types

3.2.1 Weekly EHS Inspections

For projects encompassing 1-week duration or more of consecutive workdays, the Site Supervisor shall conduct a weekly inspection of his/her area(s) of responsibility at the project site. The inspection shall:

- a. Include site conditions, employee and Subcontractor behaviors and work practices, pollution prevention and waste management practices, wastewater and other environmental conditions, or any other applicable requirements specified in the project EHS Plan(s).
- b. Be documented in an inspection report identifying the date, time, site conditions/operations, activities observed, personnel conducting the inspection, findings, recommended action items, individual responsible for implementation of each action item, and schedule for implementation. Attachment B may be used to document the inspection.

3.2.2 PESM Inspections

PESM inspections are budgeted inspections of remediation, clean construction, and consulting and engineering (C&E) projects. The PESM will either perform the inspection and/or designate an appropriate technical specialist. The PESM shall utilize a hierarchal risk based approach to determine inspection frequency at remediation, C&E, and clean construction projects.

- a. Specific checklist to be used for a given inspection will be determined by the PESM, based on the scope and risks of the project. The pertinent portions of each applicable checklist should be covered during at least one inspection annually.
- b. For programs with multiple task orders, the PESM will identify the task orders which should be inspected. Inspection frequency will be risk based to include an assessment of project scope, complexity, staffing, potential environmental, health, and safety standards.
- c. Inspections should occur soon after site mobilization and initiation of site activities. Subsequent PESM inspections shall be based upon the results of previous inspections; greater risk = increased inspection frequency. The PESM shall coordinate the date and time of the inspection with the PM and the SM.

For C&E field projects the PESM shall evaluate the need for field inspections. The determination of whether an inspection

(s) is required should consider the factors described in paragraph b. above

Inspection frequency should be identified in the project EHS Plan.

3.2.3 Communicating Significant Inspection Findings

The PESM shall *immediately* call the Director, EHS Services to report significant inspection findings including those that might require agency reporting. The Director, EHS Services, in conjunction with the legal department, will help the Project Manager and PESM determine if the finding requires agency reporting. If a determination is made that a finding must be reported, the client and agency will be notified in accordance with EHS 1-7, Event Reporting and Investigation.

▼3.2.4 PESM Inspection Reporting

The PESM shall post inspection reports, including checklists (Attachment C) and action items (Attachment E or equivalent), to the PESM Inspection Database within 10 days of the inspection.

All Action Items should be classified by the PESM as either Major or Minor, or recommendation. Major findings shall receive first priority schedule for addressing action items.

▼3.2.5 Inspection Closure

Action items should be addressed as described in the Action Item Report by the Project Manager and forward the completed Action Item Report to the PESM.

The PESM shall review the completed Action Item Report to ensure completeness and appropriate closure of all Action Items. The PESM shall post completed Action Item Reports to the PESM Inspection Database and close the inspection.

▼3.2.6 Office/Warehouse Inspections

The Operations Manager shall ensure that EHS inspections are conducted at least quarterly at each office and warehouse, except for fire extinguishers and first aid kits which shall be inspected monthly. Attachment F, or an equivalent, shall be used to conduct and document the inspection. The Operations Manager shall send a copy of the completed Inspection Checklist to the Director EHS Services.

The Operations Manager shall ensure implementation and documented closure of all action items using the Action Item Report (Attachment E) or equivalent. The Operations Manager shall send the completed Action Item Report to the Director, EHS Services, within 30 days of conducting the inspection.

3.3 Root Cause Analysis of Inspection Results

Inspection results should be analyzed for root causes. At least annually, the Director, EHS Services OR Director, Quality Programs, or his/her designee, shall review PESM inspection findings to identify trends.

This review should be documented and forwarded to the ESQ Program Directors, and to the Chief Executive Officer.

The ESQ Program Directors and the Chief Executive Officer will utilize the analysis to develop program and environmental objectives and targets, as appropriate.

3.4 Training

The Director, EHS Services, shall ensure that individuals responsible for conducting inspections understand the Company's program requirements; applicable federal, state and local laws and regulations; and proper inspection techniques.

3.5 Recordkeeping

Records of all inspections and closure of identified Action Items related to EHS inspections shall be documented and maintained by the office or project as follows:

- a. Informal Inspections Project Files
- b. Weekly Inspections Project Files
- c. PESM Inspection Report PESM Inspection Database
- d. Completed PESM Inspections Action Item Report PESM Inspection Database
- e. Completed Office/Warehouse Inspections and Action Item Reports Operations Manager

▼4.0 GUIDELINES

4.1 Definitions

▼4.1.1 Major Finding

A finding that indicates the real-time presence of a potential or imminent hazard, significant regulatory violation, or may result in imminent harm to people, property or the environment. Major findings are typically observed in the field at the time of inspection, and require immediate corrective action to reduce the risk of loss. Major findings must receive top priority for correction.

4.1.2 Minor Finding

An observed finding which by itself is not a direct hazard, or potential harm to human health or the environment. Minor findings are usually associated with documentation, programmatic deficiencies, recordkeeping, reporting, or management/organizational practices.

4.1.3 Examples of different types of findings:

Example #1: Findings associated with Stormwater Control Systems

- a. Major A significant breach in erosion control feature (e.g., missing or deteriorated hay bales).
- b. Minor Failure to maintain documentation of required periodic inspections of erosion control features.

Example #2: Compliance with OSHA Ladder Standards

- a. Major Defective extension ladder observed.
- b. Minor Failure to ensure all ladders are routinely inspected.

4.2 Informal Inspections

The ESS and all Company employees and Company subcontractor employees should be continuously aware of workplace and environmental conditions and the work practices of their fellow workers. If a substandard condition of work practice is identified, it shall be brought to the attention of the individual or supervisor, and corrected. Hazard Report and Suggestion Form (Attachment A) can be used to report substandard conditions or work practices. ZIP Slip (Attachment G) can be used to report exceptional practices or substandard conditions. ZIP Slips may be completed electronically using the Company Zip Slip Database. The Compliance Hot Line can also be utilized for anonymous reporting (See PP-18, Employee Reporting, Hotline and Non Retaliation).

4.3 PESM Inspection Process and Components

4.3.1 Project Documents Review

The inspector should review project documents (Contract, TIP, Work Plans, EHS Plan(s), any pertinent decision documents, subcontractor approvals, permits, etc.) before the inspection.

4.3.2 Inspection Checklist/Project-Specific Protocol

The PESM should utilize the appropriate PESM Inspection Checklists (Attachment C) to perform the site inspection. Only the portions of the checklist applicable to the project being inspected will be utilized. The PESM should modify the inspection checklist as necessary for major projects.

Detailed environmental compliance checklists are very useful for the first PESM inspection of a site to ensure nothing is overlooked. (This is especially helpful if you are not the Project Regulatory Compliance Specialist and are not familiar with site activities). For subsequent PESM inspections, the Project's Regulatory Compliance and Waste Management Plans (or relative sections of the EHS Plan or Work Plans) may be used as the basis for the inspection to ensure site is implementing the Plan/s.

4.3.3 On-Site Inspection Elements

The PESM Inspection shall include:

- a. High risk activities (HIPO) and a visual inspection of the site. Areas of the project site that may be accessed and inspected include but are not limited to, exclusion zones, buildings, and waste storage areas.
- b. Completion of applicable and selected portions of the PESM Inspection Checklists or equivalent documentation (Attachment C).
- c. A review of on-site records (e.g., permits, agency approvals, waste analyses, waste profiles, waste manifests, discharge

monitoring reports, training records, etc.).

- d. Positive recognition of conformance.
- e. Non-conformance noted by the PESM that can be remedied during the conduct of the inspection will be corrected. Conformance and non-conformance shall be documented on the PESM Inspection Checklists.
- f. Training of project and subcontract personnel, when possible, to address non-conformances.
- g. Identification of any observed positive practices.

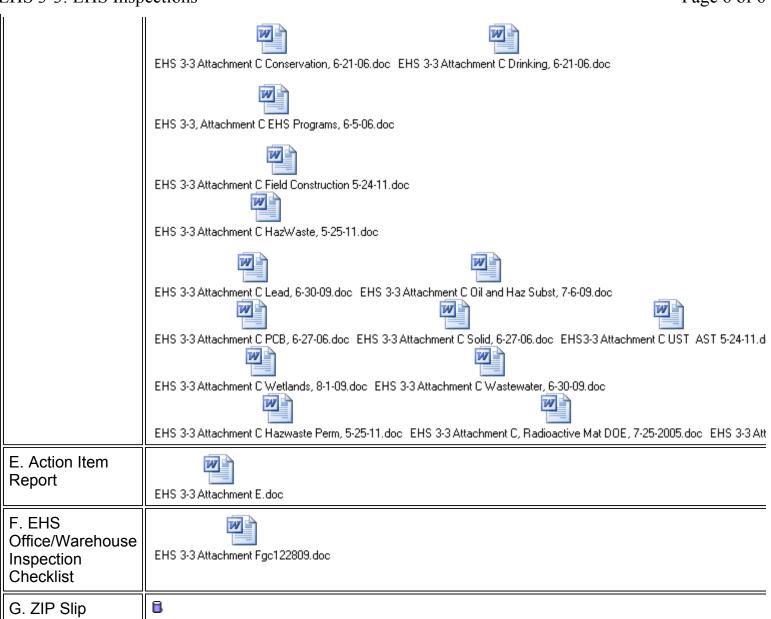
The PESM will stop work if any conditions or work practices are identified which pose imminent danger to the environment or to the safety and health of personnel.

▼5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column	
Environmental Health & Safety Programs, Procedure EHS 1-7, Event Reporting and Investigation	a	
2. Personnel Practices Procedure PP-18, Employee Reporting, Hotline, and Non-Retaliation	1	
3. Project Initiation and Operations Procedure PO-2, Task Initiation (TIP)	a	
4.		
5.		
6.		

▼6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
A. Hazard Report and Suggestion Form	ehs 1-7 Attachment B040301.doc
B. EHS Weekly Checklists and Action Item Report	EHS 3-3 Attachment B, 3-24-2011.doc
C. PESM Inspection Checklist(s)	EHS3-3 Attachment C Air, 8-10-09.doc EHS 3-3 Attachment C Asbestos 5-24-11.doc



Tetra Tech EC, Inc.

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Tetra Tech EC, Inc.

Proprietary Information

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS		COMMENTS/NOTES

This checklist applies to all projects

Pro	gra	am	Adn	ninistration and Documentation	
				EHS Procedures. Site has access to current, relevant EHS Program requirements through CRL or other communication source.	
				Awareness Recognition Programs (EHS 1-2). EHS awareness being implemented (e.g., postings, posters, etc.). EHS recognition program instituted.	
				Employee Participation Program (EHS 1-3). "Major Projects" have EHS Committee, meetings held, and files contain required documentation. The EPP has been implemented and documented (EHS 1-3, Section 3.3).	
			4.	Subcontractors (EHS 1-4).	
				A) HIPO Field Contractors have been approved and proper documentation is maintained.	
				b) Waste Management Subs have been approved (including lower tier subcontractors) and proper documentation is maintained.	
			5.	Visitor Safety (EHS 1-5). Visitors entering site have complied with procedural requirements.	
			6.	EHS Meetings (EHS 1-3)	
				EHS Daily Briefings conducted – contents properly documented, EMS issues discussed (ESQ Policy, worker impacts to environment, pollution prevention).	
				 b) "Major Projects" conduct weekly meetings. Documentation is maintained. 	
			7.	Incident/Regulatory Reporting (EHS 1-7)	
				a) Incident reports submitted for all incidents in a timely fashion.	
				b) Investigation report submitted for all incidents in a timely fashion.	
				c) Corrective actions identified in the investigation report have been completed and closure has been documented.	
				d) Employer's first report of injury prepared and submitted on time.	
				e) Permit exceedences/spills/releases have been reported to regulatory agencies as required by law or regulation.	
			8.	Manifests/TtEC Permits (EHS 1-8).	
				a) Manifests are not signed by TtEC personnel except as allowed by EHS 1-8.	
				b) No environmental permits in TtEC's name or TtEC as operator except as allowed by EHS 1-8.	

Project	Project: Inspector:			Date:		
Yes No N	/A R	EQU	UREMENTS			COMMENTS/NOTES
	9.	Pers EHS Wed Air/i mor noti EHS	cordkeeping (EHS 1-9). sonnel medical clearance S Correspondence S Logbooks ekly Reports noise monitoring records nitoring records, chain of fications as necessary. S Compliance Documents S Program Documentatio	n, employee		
	10.	Hav age mai	e any inspections been on ncy? If so, when? Exter	ctions/Notices (EHS 1-10). conducted by external EHS regularial EHS Inspection checklist concations were made per procedure?	npleted,	
	11.	EHS	S/EMS Training (EHS 1-	11).		
		a)		ontractors) have required EHS an n is maintained on-site as require		
		b)	Training on EHS, WM, a documented (EHS 3-2).	ind DOT Plans have occurred an	d is	
		c)	Are personnel trained in activities?	the environmental aspects of the	eir	
	12.		onomics (EHS 3-1). Fien conducted as suggeste	ld and Office Ergonomic evaluati ed in EHS 3-1	ons have	
	13.	EHS	S Plans (EHS 3-2).			
		a)		EHS 3-2, including requirements of the safety or environmental sta		
		b)	Are TIP/RMP risks incor	porated into EHS plan?		
		c)	Completed, approved, a	nd signed copy is on-site.		
		d)	Has been modified to re	flect changing site condition/activ	vities.	
		e)	Is being implemented as	s written.		
		f)	Identifies activity hazard hazards (EHS 3-5).	analyses, which adequately add	ress site	
		g)	Identifies PPE, which is and potential exposure I	appropriate for site contaminants evels, and site activities.	s, actual,	
		h)	Identifies Air/Noise mon contaminants and activit	itoring strategy (s), which is appreities.	opriate for	
		i)	Lists action levels which being implemented.	are appropriate and action level	s are	
		j)		Z, and support zones, site is clea s per EHS plan (EHS 3-4).	rly	

Project: Inspector:				Inspector:	Date:	
Yes N	Yes No N/A REQUIREMENTS		JIREMENTS		COMMENTS/NOTES	
						T
			k)		personnel and equipment decontamination is are being implemented (EHS 5-1).	
			I)	Includes Emergency Re site emergencies (EHS	esponse Plan, which addresses potential 2-1).	
			m)	Communications (EHS 4 Hearing Conservation (E	Pathogens (EHS 4-1), Hazard 4-2), Radioactive/Mixed Waste (EHS 4-3), EHS 4-4), and Temperature Extreme (EHS oplicable. Requirements are appropriate ed.	
			n)	Addresses respiratory p Program being impleme	rotection program (EHS 5-2) requirements. ented.	
			0)	Addresses environment	al conditions and regulatory requirements.	
			p)		ms, management requirements (including d transport/disposal plans. These implemented.	
			q)		vironmental permits – permits are current tions are implemented. (Refer to specific	
		14.	Ins	pections (EHS 3-3).		
			a)	Weekly/monthly inspect are documented.	ions conducted. Closure of action items	
			b)		ESM inspection action items are action items not closed must be forwarded this inspection).	
Pos	tings	s/ Si	gns/	Labeling/ Markings		
		15.	os	HA Job Safety & Health F	Poster.	
		16.	OS	HA 300 Log (February) po	osted.	
		17.	os	HA Noise Regulation pos	sted.	
		18.	Dep	partment of Labor Posting	gs.	
		19.	Em	ergency phone numbers	posted.	
			a) b) c) d) e) f) h) i)	Evacuation routes posted All hazard warning signs Noise hazard warning signs Control zones clearly ide Site perimeter posted ar Emergency exits clearly Fire extinguishers clearl Safety showers/ eyewas Circuit breakers labeled Low overhead hazards of	igns. entified. nd controlled. marked. ly marked. shes clearly marked clearly marked.	
		21.	Col	by of TtEC Work Rules Po	ostea (EHS 3-6).	

Project:	Inspector:	Date:
Yes No N/A	REQUIREMENTS	COMMENTS/NOTES
	22. ESQ Policy posted.	1
	23. TtEC Hotline Poster.	
	24. ZIP/EMS Bulletins are posted, as appropriate.	
Work Pr	actices and EHS Knowledge	
	25. Identify at least 1 Safety Observation performed	
	a) Do Site Personnel: Where appropriate PPE Understand risks Implement appropriate controls Implement permit systems Comply with EHS Plan requirements	
	b) Do Supervisors: Provide appropriate tasking Identify competent persons as necessary Provide sufficient oversight	
	26. EHS personnel have good knowledge regarding use and limitations of the monitoring equipment.	
	 TtEC (including craft labor) and subcontractor employees are aware of the ESQ policy and commitments it contains. 	
High Lo	ss Potential Activities (Meet TtEC and/or Regulatory Requirements)	
	28. Asbestos operations (EHS 8-1).	
	29. Hazardous Materials Management (EHS 3-7).	
	30. Confined space entries (EHS 6-1).	
	31. Drill rigs (EHS 6-2).	
	32. Excavations (EHS 6-3).	
	33. Lockout/ tagout (EHS 6-4).	
	34. Hotwork (EHS 6-5).	
	35. Boating (EHS 6-6).	
	36. Drum Handling (EHS 6-7).	
	37. Adequate fall protection (EHS 3-8).	
	38. Hydroblasting.	
	39. Demolition (EHS 6-8).	
	40. Crane operations.	
	41. UXO Operations.	
Emergen	cy Preparedness	
	42. SCBAs for emergency use inspected each month and documented.	
	43. Sufficient dedicated ER equipment available.	

ATTACHMENT C TETRA TECH EC, INC. PESM INSPECTION CHECKLIST—EHS/EMS PROGRAMS

CONFIDENTIAL

Proje	Project: Inspector:		Date:	
Yes No	o N/A	REQUIREMENTS		COMMENTS/NOTES
		 Sufficient trained CPR/ first aid personnel TtEC requirements). 	available. (See EHS 1-11 for	
		5. Site personnel trained to perform ER tasks	s per EHS Plan.	
		6. ER drills conducted per EHS Plan.		
		7. Emergency response phone numbers veri	fied.	
		Local fire department, hazardous material of TtEC expectations for emergency situat		
Envir	onme	ntal Management System		
		 Project-Specific Significant Environmental Project-specific significant environmental identified in TIP. 		
		 Significant EHS Risks The Project/Site Mescribe project environmental and H&S r 		
		a) Pollution Prevention. Does project paper, bottle, cans, construction debi (specify). (Please c why not?		
		 Document Control. No obsolete compar maintained on-site. See PO-8 for requirer current company procedures/ have access 	nents. Project Staff utilize	
		2. Operational Controls. The operations/ac project-specific significant environmental r in accordance with specifications included other project plans, and/or applicable prod are described as mitigation measures in T	risks (aspects) are carried out I in the project work plan, cedures. Operational controls	
		 Monitoring and Measuring and Correcti environmental risks (aspects) are being m Corrective action to address deficiencies i documented in project files. 	onitored and measured.	

-- End of Checklist--



CONFIDENTIAL

Project:		Inspector:	Date:
Yes No N/A REQUIREMENTS			COMMENTS/NOTES
This ched	cklist applies to all projects inv		

Utilities (Applies if project involves the construction, extension, or hookup or shutoff of utilities.) Utilities. Project involves the construction, hook-up or shut-off and extension of the following utilities. Circle all that apply. a. Electric b. Phone c. Water d. Sewer e. Gas f. Other: **Permit/Approval.** Permit/approval from local government, state utility siting commission, state agency, or federal base personnel was obtained prior to commencing construction, extension, hook-up, or shut-off activities. Permit/approval is located in the on-site project files or conspicuously posted, if required. (State/local regulations, Base requirements) Inspection. Regulatory agency has conducted an inspection of the activities. In the adjacent column note the date of the inspection(s) and the results. Zoning/Land Use **Zoning.** Project constitutes an approved use for the zoned area. If not, a conditional use permit or request for re-zoning has been obtained. (State/Local regulations) Note: This issue normally will apply to larger project in which landfills are being constructed, or other larger facilities are being developed. Building Code. Project involves the construction or placement of temporary or permanent buildings, equipment, or structures. State/local agency or base personnel responsible for reviewing/permitting these structures has been consulted. Permits and/or reviews have been obtained, if necessary. Buildings/structures comply with federal, state, and local building codes. (State/Local regulations) If an inspection was conducted note the date and results. **UFC.** Project involves the construction or placement of temporary or permanent buildings, equipment, or structures. State/local agency or base personnel responsible for reviewing fire safety has been consulted. Permits/approvals/reviews have been obtained, if necessary. Buildings/structures comply with federal, state, and local fire codes. (State/local regulations) If an inspection was conducted note the date and results.

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS		COMMENTS/NOTES
	placement of temporary structures which will be exceed 200 feet in heigh for the project or a deter	Project involves the construction or or permanent buildings, equipment, or constructed adjacent to an airport or ht. FAA Certification has been obtained mination has been made that the ect files contain the FAA certification or h (14 CFR 77).	
	8. Noise. Project generates noise emissions (e.g., drilling rigs, construction equipment, etc.). Project is in compliance with state or local noise control standards. If restrictions have been placed on hours of operation, project operating logs demonstrate compliance with these restrictions. (State/Local regulations).		
	drawings have been sta	gs. As-builts, specifications, or mp/sealed by PE or certified by other ble, in accordance with state/local	
	10. Demolition Activities. structures or equipment	Project involves the demolition of .	
		ce/License. Notice is maintained in I conspicuously, if required.	
	regarding the presend Mercury, Lead and O structures, processes	ces. A pre-demolition determination ce of hazardous substances (PCB, thers) associated with building and equipment has been made. Segregation of these hazardous efore demolition.	
	presence of asbestos	ation. A determination regarding the has been made. Proper notifications CFR 61, State/Local agencies)	
		tion. Debris and other wastes have nd are being properly managed and	
Miscellane	ous		
		Dig-safe/ "hot dig" permits/approvals rmits are maintained in the project files.	
		ion/Maintenance/Abandonment. ng/abandonment of wells.	

Project:		Inspector:	Date:
Yes No N/A	REQUIREMENTS		COMMENTS/NOTES
	Permit/approval/notif	-Drill Notification/Start Card. Ification was obtained in a timely tained in the project files. (State/Local	
		. Documentation of Driller or gist licensing/certification is maintained te/Local regulations)	
	constructed/abandor	Abandonment Standards. Well was ned in accordance with regulatory . (State/Local regulations)	
	submitted in a timely	t Notification. Notification was y manner and a copy is maintained in ate/Local regulations)	
	13. Clean Fill Certification/Testing. Project files contain analytical testing or letter from supplier (which may be the client if from project site) that soil is clean. (State/Local regulations; GMP)		
	14. Soil Erosion Control. Project involves excavation, grading or other land disturbing activities associated with construction projects.		
	Individual Permit for Construction Project	Project is complying with General or Stormwater Discharges from its as required by State/Local in the Europe of Stormwater in the Europe of St	
	Plan and effectively i	diment Control Plan. Project prepared implements erosion controls, ntenance requirements.	
		n. Activities are being conducted in permit. Permit is maintained in the	
	prepared a SWPP Plan t Construction SWPP requ	Prevention (SWPP). Project has to comply with the Industrial or uirements (State/Local regulation) to nemical contamination from migrating dary.	
	(SPCC). Projects storing regulations (40 CFR 112 SPCC Plan and/or regist	ol and Countermeasures Plan g oils in quantities subject to federal 2) have prepared and implemented an tered tanks (State/Local regulation). dous substances checklist.	

Project:	Inspector:	Date:
Yes No N	A REQUIREMENTS	COMMENTS/NOTES
	17. Dust Control. Project involves land disturbanc generates fugitive dust and all reasonable meas local standard) are being used to minimize fugit (State/Local regulations)	ures (or other
	a. Planning. Project has plans, specifications a procedures for the control of fugitive dust	nd or
	b. Inspections. Project is observing and taking visual dust is observed. Responsibility for dust visual monitoring is assigned and understood.	
	 c. Control Measures. Project has equipment ar site to effectively control fugitive dust from land activities. Controls are implemented in active a not fully stabilized) construction areas. 	disturbance
	 d. Effectiveness. At time of inspection fugitive of observed to be minimal and controls used to minimal were observed (e.g., water tank truck). 	
	18. Stream Crossing. If applicable, the USACE § been obtained. State may also require permit. "Wetlands/Streams/Floodplains" checklist.	
	Land Surveying. Licensed/registered Professional Surveyor performed the surveying and stamped appropriate documentation. (State/local regulation)	/sealed
Activitie	s That Impact Roads/Traffic (Applies if roads or traffic	will be impacted by project activities.)
	20. Road Alteration/Curb Cuts. Opening/access paper approval has been obtained from the local or state to commencing construction. (State/local regulation)	ate agency prior
	21. Heavy/Large Loads. Permit/approval has been state/local agency authorizing shipment. Time weight limits for shipment are being complied w transportation regulations)	estrictions and
	22. Traffic Impact Analysis. If required, the analysis conducted and approved by the local regulatory regulations)	
	23. Road Crossing/Easements. For public road of of-way permit was obtained from state/local age private road crossing, right-of-way permit or eas obtained from private landowner. Permits/appromaintained in the project files. (State/local regul	ncy. For ement was evals are

ATTACHMENT C TETRA TECH EC, INC.

PESM INSPECTION CHECKLIST—FIELD CONSTRUCTION AND ROAD IMPACTING ACTIVITIES

Project:	Ins	spector:	Date:
Yes No N/A	REQUIREMENTS		COMMENTS/NOTES
	Transportation (Includes the ac See 49 CFR 172.101 Hazardous		ing and shipment of DOT-regulated Hazardous
	identify hazardous materials by the project and address) Transportation. Project plans s transported over public roadways DOT requirements. Complete and hazardous waste (as applicable)	
	back of a pickup truck) that are accessible by the capacity of > 119 gallor package"), the tanks m a Class 3 Flammable L	iect uses "fuel trucks" (i.e., tanks on for diesel fuel transport along <u>roads</u> the public and the tanks have a ns (e.g. DOT definition of "bulk tust be placarded on all 4 sides with iquid placard & it must display the Γ Identification Number (49 CFR	
	End of	f Checklist	

EHS 3-15: Underground Utilities

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Deborah Rambarose on 04/03/2002

ESQ - Environmental Health & Safety Programs

Purpose: This program provides requirements and recommendations relative to identification, location, avoidance, and management of

underground utilities, appurtenances, and structures during intrusive activities.

Version Date:

05/16/2002 - Revised

Original Issue Date:

02/20/2002

Category:

Company Procedures

Sub Category: Departmental/Discipline

Document Type:

Document Owner:

Sections:

Procedure

Skip Parry

Index:

Keyword

EHS Compliance/Waste Management, Field

Activities/Science, Operational Control, Training, Monitoring

Approved

By:

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7.0 REFERENCES

8.0 ATTACHMENTS

Attachment A – Underground Utilities Locating and Marking Checklist

Attachment B - Underground Utilities Management Checklist



1.0 PURPOSE

This program provides requirements for identification, location, and avoidance of underground utilities, appurtenances, and structures during intrusive activities, as defined in Section 4.0. The program also addresses actions to be taken in response to encountering or contacting underground utilities.



2.0 SCOPE

These requirements are applicable to all Tetra Tech EC, Inc. (TtEC) operations. The procedures address the requirements and recommendations for identifying and locating, working around, and encountering or contacting underground utilities.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs, is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Aggressive Methods

The use of mechanized equipment such as excavators, backhoes, drill rigs, directional drilling, road saws, etc. Non-Aggressive methods involve the use of manual or non-mechanized methods such as hand-digging with shovels and air/hydro/vacuum methods.



4.2 Buffer Zone

As defined in this procedure, the area around a utility where only non-aggressive excavation methods may be utilized, unless specific conditions are met.

The definition cited above, and the excavation requirements and restrictions associated with it, will vary depending on the particular state regulations. TtEC requires the imposition of a four-foot Buffer Zone on all sides of the utility as measured from the outside edges of the utility, both horizontally and vertically. Since most jurisdictions recognize Buffer Zones which vary somewhere in the range of 18 to 36 inches, this distance <u>must</u> be verified by consulting the applicable state regulations before excavating so that adjustments to surface markings can be made to achieve the TtEC-required four-foot buffer zone.

Referred to as the "Tolerance Zone", "Safety Zone", or "Approximate Location of Underground Utilities" in some jurisdictions.

Information relative to excavation within the buffer zone is contained in Section 5.2.2.4.



4.3 Competent Person

A Competent Person has the ability to recognize hazards associated with underground utilities and the authority to stop or direct operations to ensure the safety of personnel and conformance with this procedure. The Competent Person has an understanding of this procedure, and the "One-Call" system requirements for the jurisdiction where excavation is occurring. The Competent Person must be capable of notifying One-Call agencies and maintaining and tracking One-Call Locate Numbers. Additionally, they must have knowledge of methods and work practices for utility identification, avoidance, and protection.



4.4 De-Energize

As applicable to a utility, to physically eliminate and/or prevent the presence, transmission, flow, or release of energy or materials which may cause harm to personnel or property.



4.5 Excavation

An operation for the purpose of movement or removal of earth, rock, or the materials in the ground, including but not limited to; digging, blasting, augering, backfilling, test boring, drilling, pile driving, directional drilling, grading, plowing-in, hammering, pulling-in, jacking-in, trenching, tunneling, structural demolition, milling, scraping, tree and root removal (grubbing), fence or sign post installation. TtEC requires that the designated One-Call agency for the applicable jurisdiction be contacted any time an intrusive activity is planned.

4.6 Jurisdiction

The authority having legal jurisdiction relative to regulations and requirements for notification of excavation activities and associated identification and marking. In the United States, the states have jurisdiction, and most consider the regulations applicable when excavation is to be performed in any location, including any public or private way, any company right-of-way or easement, or any public or privately owned land or way.

4.7 Locate

To indicate the existence of a utility by establishing a mark through the use of flags, pins, stakes, paint, or some other customary manner, that approximately determines the location of a line or facility.

4.8 Locate Request

A communication between an entity performing intrusive activities and a utility marking agency (One-Call, etc).

4.9 Observer

The person assigned to visually monitor and, as needed, signal the operator during mechanized intrusive activity when the activity is occurring within four feet of the outside edge of the buffer zone. This person remains in close communication with the equipment operator(s) and will stop the activity if needed.

4.10 One-Call Agency

An entity that administers a system through which a person can notify owners/operators of underground lines or utilities of the intent to perform intrusive activities in proposed public areas.

4.11 Positive Response

Communication with the entity performing intrusive activities, prior to the activity, to ensure that all contacted (typically via the One-Call agency) owner/operators have located and marked the underground utilities.

4.12 Potholing

The practice of exposing an underground facility by safe, non-aggressive excavation methods in order to ascertain the precise horizontal and vertical position and orientation of underground lines or utilities.

4.13 Underground Utility

An underground or submerged conductor, pipe, or structure used in providing electric or communications service (including but not limited to, traffic control loops and similar underground or submerged devices), or an underground or submerged pipe used in carrying, providing, or gathering gas, oil or oil product, sewage, storm drainage, water or other liquid service (including, but not limited to, irrigation systems), and appurtenances thereto. As used in this procedure, utility includes all underground appurtenances and structures.

The following are examples of the types of underground utilities that may be present in a given location:

- · Natural gas pipelines
- High voltage electric cables

- Water pipelines
- Fiber optic telecommunications lines
- Steam pipelines
- Gasoline, oil, or other fuels
- Sewer pipelines
- Hazardous Materials
- Underground Storage Tanks (USTs)
- Abandoned underground structures containing hazardous materials, hazardous wastes, and radioactive materials

Note: Electrical and pressurized mechanical underground utilities that are not energized shall be considered as applicable to the requirements of this procedure until they are disconnected and removed or protected by a lockout/tagout system approved by TtEC (see Section 5.2.2.6)

4.14 Underground Utility Owner

Any person, utility, municipality, authority, political subdivision or other person or entity who owns, operates, or controls the operation of an underground line/facility.

4.15 White Lining

The practice whereby the entity which intends to perform intrusive activities pre-marks the site with an outline of the area where intrusive activities will occur. This involves the use of <u>white</u> paint, flags, stakes, or a combination thereof to mark the extent of where work is to be performed. The marking may vary depending on what intrusive activities are to be conducted. For example, for general excavation, an areal outline of the excavation shall be marked, while for drilling, the individual boreholes shall be marked. Studies have shown that pre-marking is a practice that does prevent utility contact incidents.



5.1 Responsibilities

5.1.1 Competent Person

The Competent Person shall be responsible for:

- Obtaining a copy of, and understanding the applicable regulations for the state of jurisdiction where the excavation activities are to be performed.
- Contacting the appropriate One-Call agency or private locating service, as applicable.
- Recording One-Call locate numbers.
- If necessary, renewing One-Call locate numbers before expiration.
- Ensuring that white-lining of the area to be excavated is performed.
- Ensuring that a "positive response" has been received from every utility owner/operator identified by the One-Call agency and that they have located their underground utilities and have appropriately marked any potential conflicts with the areas of planned intrusive activities.
- Completion of the *Underground Utilities Locating and Marking Checklist* (Attachment A) and the *Underground Utilities Management Checklist* (Attachment B).
- Reviewing applicable AHAs with all project members before work begins.
- Conducting training on communication protocols to be used by the excavation observer and equipment operator.
- Ensuring Implementation of appropriate work practices during intrusive activities (including maintaining the prescribed buffer zone for use of aggressive methods).
- Conducting daily inspections of the excavation area to make sure that all markings are intact.
- · Maintaining required records.
- Providing the Environmental and Safety Supervisor (ESS) with all required documentation on a daily basis.

5.1.2 Observer

Whenever intrusive operations with mechanized equipment are being conducted within four feet of the outside edge of the buffer zone, horizontally and vertically, an observer must be assigned to monitor the activities. The observer is responsible for:

- Observing the operation to ensure that the operator stops operations if utilities are observed.
- Reviewing hand signals and other forms of communication with the operator.
- Properly signaling the operator.

- Stopping the operation immediately if the observer's attention must be diverted even momentarily.
- Stopping the operation immediately if a hand signal or other directive is not followed. Operations will not resume until the observer and operator mutually agree that the reason(s) for not complying with the directive(s) are/is identified and fully corrected.
- Maintaining required records, such as logbook entries, or other, as requested by line management.

5.1.3 Line Management

The Project Manager (PM) shall be responsible for:

- Ensuring compliance with this procedure.
- Providing the necessary resources for compliance with this procedure.
- Designating Competent Personnel in consultation with the Project Environmental, Health and Safety Manager (PESM) prior to the start of work.

5.1.4 Environmental, Health and Safety Personnel

The Environmental and Safety Supervisor (ESS) shall be responsible for:

- Providing oversight on the implementation of the requirements contained in this procedure.
- Consulting with the PM and Competent Person on underground utility issues.

5.2 Procedure

The following sections provide the requirements and recommendations of this procedure, which are intended to prevent injury to personnel, damage to infrastructure, and associated indirect effects associated with encountering or contacting underground utilities during the execution of intrusive work. Underground utilities present multiple potential hazards that must be recognized before and during work which occurs near them, therefore, this procedure is divided into sections addressing underground utility identification and location, working around or near underground utilities, and actions to be taken in the event that underground utilities are encountered or contacted. Hazards that may be presented by underground utilities include explosion and fire, electrocution, toxic exposures, pathogens, and drowning.

5.2.1 Identifying and Locating Underground Utilities

The possibility of the existence of underground utilities must be evaluated as early as possible in the planning phase for any project which involves intrusive activities, as defined in Section 4.2. The Task Initiation Procedure (TIP) form should be used for documentation of the identification of this potential hazard and the procedures to be followed to address them. The following sections describe various methods for identifying and locating utilities on a site. Plans should be verified during the readiness review. The *Underground Utilities Locating and Marking Checklist* (Attachment A) and the *Underground Utilities Management Checklist* (Attachment B) must be completed before any activities meeting the definition of excavation in Section 4.2 are conducted. Attachment A is intended to be used as a guide during the process of locating and marking utilities in the area to be excavated. Attachment B is intended to be used as a guide in the overall process of underground utilities management during the course of the project.

All underground utilities on a site involving excavation as defined in Section 4.4, must be located and identified before intrusive activities commence, by one or more of the following entities:

- The Utility Owner
- A Private or Public Utility Locating Service
- An Approved TtEC Competent Person

These options are described in greater detail in the following Sub-Sections:

5.2.1.1 Pre-Planning and the Site EHSP

- The Site-Specific Environmental Health and Safety Plan (EHSP) developed for the project must:
- Identify the location and types of underground utilities that are believed to be present on the site.
- Reference this procedure (EHS 3-15), and describe how it will be implemented on the project.
- Contain an Activity Hazard Analysis in which the hazards associated with underground utilities are identified, as well as the measures used to control them.
- Contain, as an appendix, a copy of the applicable regulations from the state of jurisdiction where excavation activities are to be performed. These can usually be obtained via the Internet.
- Contain clear and concise procedures to be followed in the event that contact with underground utilities occurs.
- Address underground utilities and potential associated scenarios in the emergency response section of the EHSP.

5.2.1.2 "One-Call" Locating and Marking Services

Every state has utility marking service programs having various names such as "One-Call", "Dig-Safe", "Call-Before-You-Dig", "Dig-Safely", and many others. These services will identify the types and locations of any utility that may exist in an area to be excavated, as long as the property is in the <u>public domain</u>.

- The appropriate One-Call service for the jurisdiction where the project is located must be contacted prior to beginning excavation work. The One-Call agency should be given as detailed a description of the property as possible; address, cross street, utility pole numbers, physical description, etc.
- Notification to the One-Call service shall allow sufficient lead time for the agency to mark the utilities before excavation begins. The lead times vary, but range from two to ten days, depending on the state of jurisdiction.
- A complete listing of One-Call agencies and telephone numbers for all states is available in the "Call-Before-You-Dig Call Center Directory", which can be accessed on the Internet at the WebPage (http://www.agc.org/galleries/default-file/State%20One%20call%20Centers%20Laws.doc) sponsored by "Underground Focus" magazine.
- Once notified, the One-Call agency will provide the contractor with a unique "locate number" or "reference number". This reference number must be kept in the project files by the Competent Person or designee. Additionally, the reference numbers have expiration dates, which may vary depending on the particular One-Call agency. The valid period of the locate number and required renew notification date shall be requested from the One-Call agency.
- On a project with multiple contractors, each contractor must request a separate locate number. Under no circumstances will any other contractor or entity be allowed to "work under our locate number". Subcontractors to TtEC may excavate under the locate number secured by TtEC, provided that they are excavating within the area which was previously white-lined by TtEC and subsequently marked. However, the One-Call agency must be contacted and notified of this arrangement so that the subcontractor can be recorded as working under the existing locate number. If a TtEC subcontractor will be excavating in an area not white-lined by TtEC, then the TtEC subcontractor must request a new locate.
- The area where work is to be performed shall be white-lined by TtEC personnel before the locating service goes to the site.
- It is good practice to arrange a pre-excavation meeting at the project site with the personnel performing the utility location and marking. This meeting will facilitate communications, coordinate the marking with actual excavation, and assure identification of high-priority utilities.
- The One-Call agency should provide the identities of the utility owners that will be notified of the locate request. This information shall be recorded on the Underground Utility Locating and Marking Checklist (Appendix A) and maintained in the project files. The contact person and phone number for each utility owner shall also be recorded.
- The utility owners should provide a "positive response" relative to the locate request, which can consist of two types of action by the utility owner. The facility owner or operator is required to 1) mark it's underground utilities with stakes, paint, or flags, or 2) notify the excavator that the utility owner/operator has no underground utilities in the area of the excavation.
- The positive responses shall be recorded on the Underground Utility Locating and Marking Checklist (Appendix A) and cross-checked with the list of utility owners that the One-Call agency stated that they would notify. If it is discovered that a utility owner has not provided a positive response, then the One-Call agency must be notified.
- Excavation shall not be conducted until positive responses have been received from all utility owners identified by the One-Call agency as having underground utilities on the property.
- Before beginning excavation, the excavator must verify that the location marked was correct, and the distinct, color-coded markings of all utility owners are present.
- Examine the site to check for any visible signs of underground utilities that have not been located and marked such as pedestals, risers, meters, warning signs, manholes, pull boxes, valve boxes, patched asphalt or concrete pavement, areas of subsidence, fresh sod or grass, lack of grass or vegetation, and new trench lines.
- The markings placed by the utility owners must be documented by TtEC using a still, digital, or video camera. The photo-documentation shall be maintained with the project files indefinitely.
- The markings placed by the utility owners or marking services shall follow the American Public Works Association Uniform Color Code as described in ANSI Standard Z 535.1. This code appears below.

American Public Works Association Uniform Color Code

Red	Electric Power Lines, Cables, Conduit
Orange	Communications, Telephone, Cable TV
Yellow	Gas, Oil, Steam, Petroleum or Gaseous Materials
Green	Sewers and Drains
Blue	Potable Water Systems
Purple	Reclaimed Water, Irrigation, Slurry Lines
Pink	Temporary Survey Markings
White	Proposed Excavation



• As discussed in Section 5.2.1.1, One-Call agencies arrange for the identification and marking of underground utilities only on public property, up to the point of contact with private property. In the event that excavation activities are to be conducted on non-public properties, the presence, location, depth, and orientation of all underground utilities within the white-lined area shall be ascertained through records review, including any site plot plans, utility layout plans, and as-built drawings available from the property owner, as well as through interviews with knowledgable personnel associated with the property. Additionally, the information gathered from these sources shall be verified by physical detection methods (non-aggressive), performance of a geophysical survey, or by procuring the services of a private utility locating and marking service. If any detection methods are to be self-performed, the requirements of 5.2.1.4. must be followed.

The above requirements are also intended to address the potential presence of unknown or undocumented underground utilities, therefore, the area to be excavated must also be evaluated by the PM to determine if the potential for unknown or undocumented underground utilities exist. If the determination is made that the presence of these unknown or undocumented underground utilities is unlikely, then a variance should be requested to eliminate the requirement to identify them.

A list of vendors providing <u>locating and marking services</u> can be found in the "Network of Underground Damage Prevention Professionals" which can be accessed on the Internet at the "Underspace" WebPage (http://underspace.com/index.htm).

• Variance to this requirement above must be approved by the PM and PESM.



5.2.1.4 Self-Performance of Utility Locating and Marking

The techniques and instruments used to locate and characterize underground utilities can be extremely complicated and difficult to use effectively. Additionally, interpretation of the data generated by this instrumentation can be difficult. The utility marking services described in 5.2.1.1 and 5.2.1.2 are staffed by well-trained, experienced professionals who perform locating activities on a regular basis. For these reasons, it is most desirable that these professional services are used for utility location and marking on projects.

- In some instances, such as long-term projects where excavation is a primary task, and the presence of underground utilities is extensive, it may be prudent to self-perform locating and marking activities.
- If locating and marking is to be self-performed, all personnel using instrumentation will be trained on the use of the equipment that will be used, and the interpretation of the data.
- There are variety of locating methods which may be utilized for self-performance of utility locating as categorized below:
- Magnetic field-based locators or path tracers
- Buried electronic marker systems (EMS)
- Ground penetration radar-based buried -structure detectors
- Acoustics-based plastic pipe locators
- Active probes, beacons, or sondes for non-metallic pipes
- Magnetic polyethylene pipe
- Before self-performing any underground utility locating on a project, approval must be obtained from the TtEC Director, EHS Services.



5.2.2 Working Near or Around Underground Utilities

After the site has been properly evaluated for the presence of underground utilities, intrusive activities may begin. Since there is no perfect way of eliminating the hazards presented by underground utilities, an effort must be made to perform the tasks following the direction and guidance as described by the following best practices that should be implemented during the execution of the project.



5.2.2.1 Work Site Review

Before beginning intrusive activities, a meeting shall be held between all members of the project team. This shall consist of a review of the marked utility locations with the equipment operators, observers, laborers, etc.



5.2.2.2 Preservation of Marks

During excavation, efforts must be made to preserve the markings placed by the utility owners until they are no longer required. If any markings are obliterated, the One-Call agency must be contacted for re-marking. No intrusive activities are to take place if markings are not visible.



5.2.2.3 Excavation Observer

Whenever intrusive operations are being conducted within four feet of the edge of the buffer zone, an observer must be assigned to monitor the activities. The observer will be designated each day, and a review of hand signals and other forms of communication between the observer and operator will be conducted. The directives of the observer will be followed precisely and immediately by those operating equipment.



5.2.2.4 Excavation Within The Buffer Zone

Performing intrusive activities within the buffer zone requires careful adherence to proper guidelines and procedures to minimize the risk of contact with underground utilities.

The purpose of the buffer zone is to designate and define an area where careful, prudent, and reasonable excavation practices are to be used to prevent contact with underground utilities. However, there may be occasions where it is necessary to perform aggressive excavation methods in this designated area.

The boundaries of the buffer zone as defined in Section 4.1 will be observed at all times during intrusive activities. Aggressive excavation methods (excavators, backhoes, drill rigs) must be restricted to areas outside of the 4-foot buffer zone unless a special exemption to this requirement is obtained.

Consider whether the objective of the project can be completed without performing intrusive activities in the buffer zone at all. This will greatly reduce the risks presented by performing work in close proximity to underground utilities. If after consideration, the determination is made that intrusive activities in the buffer zone are necessary, then a formal exemption request shall be made to the PESM according to the guidelines below.

A request to utilize aggressive excavation methods in the buffer zone may be made if:

- There is no other appropriate and reasonable alternative to using aggressive methods in the buffer zone; and
- The utility has been de-energized (and purged if necessary), verified as de-energized, and locked-out (per Section 5.2.2.6); or
- the depth and orientation of the utility has been <u>adequately</u> and <u>visually</u> determined through the use of non-aggressive methods such as air/hydro/vacuum excavation, potholing, probing, hand-digging, or a combination thereof; and
- for utilities containing electrical energy, the depth of the existing water table is below the location of the utility; and
- application for the exemption has been submitted to the PESM via a Field Change Notification (FCN); and
- the exemption has been granted and approved in writing by the PESM on the FCN form.

The following conditions will apply to this request:

- Aggressive methods may be used in the buffer zone only to the extent allowed by the applicable state or other jurisdictional regulations.
- Appropriate physical protection measures for exposed utilities as described in Section 5.2.2.5 shall be implemented to eliminate the potential for equipment contact with utilities.
- The extent of the project excavation area to be covered by the exemption request must be specified in the FCN.
- When evaluating the use of aggressive excavation methods in the buffer zone, the PESM will consider the type of utility involved and the associated risk potential.

Based on this evaluation, the PESM may impose further conditions and requirements, which will be detailed in the FCN.

Even if the above exemption conditions are met, the PESM has authority to deny the request, the reasons for which will be described in the FCN.

Unless exempted according to the above provisions of this procedure, only non-aggressive methods may be used within the buffer zone. Non-aggressive, or non-mechanized equipment is used in order to prevent mechanical contact with underground utilities which could result in damage to the utility and create the potential for personal injury and property damage. Following are examples of non-aggressive excavation methods:

- Hand-digging
- Non-conductive hand tools must be used when digging within the buffer zone surrounding underground electrical utilities.
- If conductive hand tools must be used near electrical lines, then the PESM shall be consulted to determine additional requirements relative to safe electrical practices, procedures, and equipment.
- Hydro-excavation (water pressure).
- Air excavation (air pressure).
- Vacuum extraction (soil excavation/removal).
- Air excavation/vacuum extraction combination.
- Aggressive methods may be used for the removal of pavement over a utility, if allowed by the state regulations.

5.2.2.5 Protection of Underground Utilities

It is very important that consideration be given to the protection of underground utilities when performing adjacent intrusive activities. This is necessary not only to prevent physical damage and associated indirect effects, but also to prevent the potential for injury to employees and the public.

- When using aggressive excavation methods within the buffer zone around exposed underground utilities, physical protection may be appropriate. Basically, this involves creation of a physical barrier between the mechanized operation and the utility. The following are some possible types of physical protective measures:
- Heavy timbers, similar to swamp mats.
- · Sheets of plywood.
- · Blasting mats.
- Once exposed, underground utilities no longer have the support provided by surrounding soil and may need to be physically supported to prevent shifting, bending, separation, or collapse, which could result in damage to the utility, and possibly personnel. Following are suggested support methods:
- Timber shoring underneath the utility.
- Timbers or girders over the top of the excavation fitted with hangers that support the utility.
- Design by a PE for complicated or large applications.
- Utilities must also be protected from objects that may fall into the excavation such as rocks and equipment. This can be accomplished by following these guidelines:
- Cast spoils as far away from the excavation as possible. Excavated and loose materials shall be kept two feet from the edge of excavations, as required by OSHA.
- Relocate large rocks, cobbles, and boulders away from the excavation and sloped spoils piles.
- When vehicles and machinery are operating adjacent to excavations, warning systems such as soil berms, stop logs or barricades shall be utilized to prevent vehicles from entering the excavation or trench.
- Scaling or barricades shall be used to prevent rock and soils from falling into the excavation.
- Barriers shall be provided to prevent personnel from inadvertently falling into an excavation.

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5.2.2.6 De-Energizing Utilities

Utilities can carry many types of potential energy, including electricity, flowing liquids, liquids under pressure, gasses under pressure, etc. A release, such as may happen if a utility conveyance is compromised, could result in personal injury, property damage, and other indirect effects. If the white lines of the proposed excavation area overlaps or extends into the buffer zone of a known underground utility, then if at all possible, that utility shall be de-energized to physically prevent the transmission, flow, or release of energy. Conversely, if the buffer zone of the known utility lies outside of the white-lined, proposed excavation area, then de-energization is not required.

- The owner of the utility shall be contacted to determine the feasibility and methodology of de-energizing the utility. Plenty of lead-time should be provided for this since it may take utility companies weeks to de-energize some utilities.
- Depending on the utility and the material being conveyed, isolation points which may be suitable for de-energizing include but are not limited to the following:
- · Electrical circuit breakers
- Slide gate
- Disconnect switches
- Piping flanges
- Other similar devices
- When utilities are de-energized, it must be verified by demonstration. This can be accomplished by testing equipment, switching on a machine or lighting, opening a valve, etc. For any current-carrying electrical equipment, such as cables, electrical panels, etc., successful de-energization must be certified through the use of appropriate electrical testing equipment.
- Whenever a utility is de-energized, a means of ensuring that the energy isolation device and equipment cannot be operated until the device is removed must be provided. Typically, this is achieved by utilizing a lockout device, accompanied by a written tag, that physically controls the configuration of the energy isolation point. Lockout devices include but are not limited to the following:
- Locks
- Chains
- Valve covers
- Circuit breaker hasps
- Blind flanges
- Slip blinds, and
- Multiple lock hasps
- When de-energizing and locking out of utilities is practiced, the provisions of EHS 6-4 Lockout/Tagout, shall be followed, as applicable.
- In the event that a utility is de-energized, but there is no means of adequately providing a physical locking-out of the utility, then a spotter must be posted at the point of isolation to ensure that the utility is not re-energized. The spotter must be supplied with a communication device such as a site radio.



5.2.2.7 Damage Discovery

During excavation, utility damage may be discovered which is pre-existing or otherwise not related to a known contact. Disclosure to the utility owner is very important because the possibility of utility failure or endangerment of the surrounding population increases when damage has occurred. The utility may not immediately fail as a result of damage, but the utility owner or operator must be afforded the opportunity to inspect the utility and make a damage assessment and effect repairs if necessary. The following guidance applies:

• Observe and photograph the utility from a safe distance and determine in there is damage. Damage would be all breaks, leaks, nicks, dents, gouges, grooves, or other damages to utility lines, conduits, coatings, or cathodic protection

systems.

• The One-Call agency or private location service must be contacted immediately.



5.2.3 Encountering or Contacting Underground Utilities

In the event that encountering or contacting an underground utility occurs, it is imperative that the appropriate actions are taken to minimize damage to the utility, prevent personal injury, and minimize indirect effects.



5.2.3.1 Encountering Underground Utilities

It is possible that underground utilities will be encountered in locations that have previously been "cleared" of having underground utilities by the locating service, or are found outside of the area which has been marked as having underground utilities. In either case, if this occurs, the following applies:

- · Intrusive activities must be curtailed
- The One-Call agency or private location service must be contacted immediately
- The PM and PESM must be notified
- No further intrusive activities may be conducted until:
- The One-Call agency/private location service and/or the subject utility owner visit the site;
- Identification of the utility owner and the type of material/energy being conveyed by the utility has been made; and
- The orientation and depth of the subject utility has been determined and suitably marked.
- A TtEC Incident Report and Investigation form must be completed per EHS 1-7. The report should be accompanied by photographs clearly showing the marking(s), and the actual location, with a distance gauge to document how far off the mark the utility was encountered.



5.2.3.2 Contacting Underground Utilities

If excavation or other equipment being used for intrusive activities makes contact with an underground utility, the following guidelines apply:

- Intrusive activities must be stopped immediately.
- Observe the utility from a safe distance and determine if there is damage. Damage would be all breaks, leaks, nicks, dents, gouges, grooves, scratched coatings, cathodic protection compromise, material leakage, obvious electrical energy.
- Move all personnel to the evacuation meeting point as described in the SSHP.

EXCEPTION: If an electrical line has been contacted and it is your belief that equipment (such as an excavator) is electrically energized, do not approach the equipment. Order the operator to remain in the equipment until emergency personnel can denergize the source (unless the equipment is on fire, at which time the operator should jump off of the vehicle and shuffle along the ground to a safe area). Shuffling is required because current flows outward through the soil in a ripple pattern called a power gradient, creating a pattern of high and low potential, Shuffling decreases the chance that these gradients could be bridged, causing current to flow through the body, resulting in electrocution.

- Secure the area to prevent the public from entering.
- Contact emergency responders as specified in the SSHP.
- The One-Call agency or if known, the utility owner must be contacted immediately.
- The PM and PESM must be notified.
- No further intrusive activities may be conducted until:
- The utility owner inspects the scene and after repairs, verifies that all danger has passed.
- The orientation and depth of the subject utility has been determined and suitably marked.
- \bullet Permission from the emergency responders to resume work has been given.
- A TtEC Incident Report and Investigation form must be completed per EHS 1-7. The report should be accompanied by photographs clearly showing the marking(s), and the actual location, with a distance gauge to document how far off the mark the utility was encountered.
- State and Local regulations must be reviewed to determine if reporting to any additional agencies is required.



Competent Persons shall have adequate experience and/or training to carry out the requirements of this procedure.



6.0 SOURCES OF INFORMATION



• Common Ground Alliance

- Center for Subsurface Strategic Action (CSSA)
- DigSafely
- National Utility Contractors Association (NUCA)
- National Utility Locating Contractors Association (NULCA)
- Underground Focus Magazine
- NUCA State Listing of One-Call centers
- Utility Safety Magazine

6.2 Vendors and Commercial Sites

- RadioDetection, Inc. (Detection Instruments)
- Heath Consultants (Detection Instruments)
- Ben Meadows Company (Detection Instruments)
- So-Deep, Inc. (Complete Utilities Services)
- Concept Engineering Group, Inc. (Air Excavation Equipment)
- Rycom Instruments, Inc. (Detection Instruments)
- Schonstedt Instrument Company (Detection Instruments)
- Forestry Suppliers, Inc. (Fiberglass Probe "Fiberglass Tile Probe", Part #77543, Approx. \$20.00, Telephone 800-647-5368)

7.0 REFERENCES

 Common Ground Study of One-Call Systems and Damage Prevention Best Practices, August, 1999, Sponsored by US DOT.

8.0 ATTACHMENTS

Attachment A – Underground Utilities Locating and Marking Checklist Attachment B – Underground Utilities Management Checklist

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ATTACHMENT 1
Tetra Tech EC, Inc.
EHS 3-15 - ATTACHMENT A
UNDERGROUND UTILITIES LOCATING AND MARKING CHECKLIST

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ATTACHMENT 2 Tetra Tech EC, Inc. EHS 3-15 - ATTACHMENT B UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

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- Forestry Suppliers, Inc. (Fiberglass Probe "Fiberglass Tile Probe", Part #77543, Approx. \$20.00, Telephone 800-647-5368)

7.0 REFERENCES

• Common Ground Study of One-Call Systems and Damage Prevention Best Practices, August, 1999, Sponsored by US DOT.

8.0 ATTACHMENTS

Attachment A – Underground Utilities Locating and Marking Checklist Attachment B – Underground Utilities Management Checklist

ATTACHMENT 1
Tetra Tech EC. Inc.

EHS 3-15 - ATTACHMENT A
UNDERGROUND UTILITIES LOCATING AND MARKING CHECKLIST

Click the icon below to launch or download.



Underground UtilitiesAttachA 04 03 03.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

ATTACHMENT 2
Tetra Tech EC, Inc.
EHS 3-15 - ATTACHMENT B
UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

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Underground UtilitiesAttachB 04 03 03.doc

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Tetra Tech EC, Inc.

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Proprietary Information

EHS 3-15 - ATTACHMENT A UNDERGROUND UTILITY LOCATING AND MARKING CHECKLIST



To be Completed by PM and/or "Competent Person"

Complete Form as Location/Marking Progresses and Maintain in Site Files

Complete Fo	orm as Location/Marking F	Progresses	and Maintain	in Site Files					
PROJECT INFORMATION:		Lo	Location:						
Project Name:		Та	Task/Activity:						
Tetra Tech EC Competent Person:		St	Start Date of Work:						
Tetra Tech EC Subcontractor: N	o □ Yes:	Pr	Private Locating Service Required: Yes No						
Property Owner:			If Not, Explain:						
NOTIFICATION:									
Locating Service Name:		La	ocating Service T	Cel Number					
Date Locating Service Notified:			Locate Ticket Number:						
Address of Property to be Marked:			Locate Ticket Expiration Date:						
Nearest Intersecting Street:			Boom Transc Englander						
Are There Any Utilities on the Prop	erties That the Locating Service	- Will Not (Lot Contact? Vec No						
Specify:	erries that the Locating Bervice	VVIII INOUN	contact: 1 cs	110					
Enter Utility Information in Table 1	Relow In Addition to Utility I	ocatina Sa	rvices Consult C	lient Utility Owners	Drawings				
Facility Personnel, Maintenance Pe		ocum sei	vices, Consun C	item, Outily Owners,	Diawings,				
ruciny i ersonnei, maintenance i e	•								
	TABLI On-Site Utility		TION						
		INTORNA	UTILITY		DATE				
		Color		EMERGENCY	MARKS COMPLETE				
NAME OF UTILITY COMPANY	TYPE OF UTILITY	CODE	ON-SITE?	PHONE NUMBER					
TVAME OF CILITY COMPANY	Electric	RED	OIV-BILE:	I HONE INCIDER					
	Communications, Phone,	ORANG	F						
	CATV	Oldino							
	Gas, Oil, Steam, Petroleum	YELLOV	W		 				
	Sewers, Drains	GREEN			 				
	Potable Water	BLUE							
	Reclaimed Water, Irrigation	PURPLI			 				
	Temporary Survey	PINK			<u> </u>				
	Markings	1 11 (12							
To be performed by excavator prior to utility mark-out.	Proposed Excavation	WHITE	2						
White-Lining Completed? ☐ No Expl	oin: \(\subseteq \text{Vac: Date}	۵٠	By Whom	.2					
	am \(\text{1 cs. Dav}	C	by whom	1!					
LOCATING AND MARKING:									
Have All Utilities Identified in Table	1 Been Marked? ☐ Yes ☐	No (If N	Not, Contact Loca	ating Service for Res	olution)				
Problem(s) With Markings?									
\square Yes \square No \square No Mar									
□ Other:	☐ Not All Utilities Marked	Per Table	1 (notify marking	g service)					
Measurements Taken: Yes	□ No								
Documentation of Marks: — Photo	os 🗆 Video 🗆 Oth	ner:							
EXCAVATION:									
Utilities Accurately Marked?	Ves □ No								
If no, describe:									
Were Unmarked or Mis-Marked Utili	ties Encountered? Ves	□ No							
If Yes, Specify:	ties Encountered: 1 cs	□ 1 10							
Locating Service Notified?	□ No								
Will Excavation Continue Past Locate		□ No							
If Yes, Locate Number Renewed?									
Any Other Problems/Concerns? Spec		Duic							

Signature:

Form Completed By:

Date:

EHS 3-15 - ATTACHMENT B

UNDERGROUND UTILITIES MANAGEMENT CHECKLIST



To be Completed by PM and/or "Competent Person" Complete Form as Project Progresses and Maintain in Site Files.

PHASE		TASK	Y E S	N O	N A	COMMENTS Required if Response is No or NA. (Reference Item Number)
Pre-Planning	1.	Excavation in Work Scope?	J			(Reference from Fulliber)
1101		(As defined in EHS 3-15, Section 4.4)				
	2.	Underground Utilities Identified in TIP?				
	3.	Competent Person Assigned?				
	4.	Has a Copy of the Applicable State Regulations Been				
		Obtained, Read, Understood?				
	5.	EHS Plan Addresses Underground Utilities?				
		(AHAs, Contingency Plan, State Regulations Appendix)				
Identifying,	6.	Locating and Marking Checklist Initiated?				
Locating and		(Attachment A)				
Marking	7.	Identification and Address of Property Determined, Including				
		Nearest Intersection?				
	8.	One-Call Agency Contacted?				
	9.	Additional Locating and Marking Required on Property? (One-				
		Call agency marks to public property line only)				
	10.	Additional Marker/Locator Identified?				
	11.	Additional Marker/Locator Qualified?				
	12.	TtEC Self-Performing Location and Marking?				
	13.					
		Services?				
	14.	Area of Excavation "White-Lined" by TtEC?				
	15.	TtEC Present When Markings Completed?				
	16.	All Utilities Marked?				
		(Refer to Attachment A, Table 1)				
	17.					
	18.					
		(subsidence, new grass, patching, etc)				
	19.	All Applicable				
		Information Recorded on Attachment A?				
	20.	Multiple Contractors Excavating On-Site?				
	21.	Separate Locate Requests for All Contractors?				
	22.	TtEC Subcontractors Excavating in TtEC White-Lined				
		Area(s)?				
	23.	If Yes to 22 Above, One-Call Agency Contacted to Determine				
		if TtEC Subcontractor Can be Added to Existing Locate				
		Ticket?				
Excavation	24.					
Activities		Personnel?				
		(Managers, Equipment Operators, Laborers, Competent Person,				
		Excavation Observer, etc)				
	25.					
	26.	Do Site Activities Have Potential to Obliterate Utility				
		Markings?				
Excavation	27.	,,				
Activities –		Markings?				
Cont'd						

EHS 3-15 - ATTACHMENT B

UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

PHASE		TASK	Y E S	N O	N A	COMMENTS Required if Response is No or NA. (Reference Item Number)
	28.	Has an Excavation Observer Been Designated to Monitor	3			(Reference Item Number)
		Excavation When Occurring within 4 Feet of the Buffer Zone?				
	29.	1				
		Signals?				
	30.	1				
Excavation	31.	Either Side of Markings Placed by Locator? Is Excavation Within The Buffer Zone Absolutely Necessary?				
Within Buffer	32.					
Zone	-	For Excavation In The Buffer Zone? If Yes, Identify				
		Appropriate Non-Aggressive Methods.				
	33.					
		(FCN) Been Approved by The PESM? If No, then Aggressive				
	3/1	Methods May Not Be Used in The Buffer Zone. If Yes to 33 Above, Has the Utility Been De-Energized,				
	54.	Purged, Verified/Tested, and Locked-Out? Or,				
		Tangou, Formour rossou, una zoonou o uv. o.,				
		Has The Depth and Orientation of the Utility Been Adequately				
		and Visually Determined Through The Use of Non-Aggressive				
	35.	Methods? If Yes to 24 Above Heye All of The Following Conditions				
	33.	If Yes to 34 Above, Have All of The Following Conditions Been Met?				
		For Utilities Containing Electrical Energy, Is The Depth of The Water Table Below The Depth of The Utility?				
		Have Regulations Been Consulted to Determine Specific State Requirements Relative to Excavating in The Buffer Zone?				
		Have Appropriate Physical Protection Measures Been Implemented to Prevent Equipment Contact With Utilities and to Prevent Damage to Utilities?				
		Has The FCN Requesting The Buffer Zone Exemption Been Signed by The PESM?				
		If No to Any of The Above Conditions, Then Only Non-Aggressive Excavation Methods May Conducted in The Buffer Zone, Since The Conditions of The Exemption Have Not Been Satisfied.				
Working Around	36.					
Exposed Utilities		Utility During Work Activities?				
		Have Spoils Been Placed as far Away From the Excavation as Feasible?				
	38.					
		(If Any Portion of the 4-Foot Buffer Zone around a Utility is Inside of the White-Lined Area)				
	39.	,				
		Physically Locked-Out?				
Working Around	40.	If No to 39 Above, Has a Spotter Been Assigned to Monitor				
Exposed Utilities		Isolation Point?				
-Cont'd	41.	, 1				
		Communications? (Radio, Telephone, etc)				
	42.	Has the Isolation Point Been Tagged?				
Damage	43.					
Discovery		Excavation?				
	44.					
	45					
	45.	Owner Been Notified? If Yes to 43 Above, Have Photographs Been taken?				

EHS 3-15 - ATTACHMENT B

UNDERGROUND UTILITIES MANAGEMENT CHECKLIST

PHASE		TASK	Y E S	N O	N A	COMMENTS Required if Response is No or NA. (Reference Item Number)
Encountering or Contacting	46.	Have Utilities Been Encountered in Locations That Have Not Been Marked?				
Underground	47.	If Yes to 46 Above, Has the One-Call Agency or Other				
Utilities		Locating Service Been Contacted?				
	48.	If Yes to 46 Above, Has the PM and PESM Been Notified?				
	49.	If Yes to 46 Above, Has a TtEC Incident Report per EHS 1-7				
		Been Completed?				
		(Include Photographs)				
	50.	Has Excavation Equipment Come In Contact With				
		Underground utilities?				
	51.	If Yes to 50 Above, Were Intrusive Activities Immediately				
		Curtailed?				
	52.	If Yes to 50 Above, Has a Damage Determination Been Made				
		From a Safe Distance?				
	53.	If Yes to 50 Above, Has the Area Been Secured?				
	54.	If Yes to 50 Above, Have Emergency Responders Been				
		Notified?				
	55.	If Yes to 50 Above, Has the Locating Agency and/or Utility				
		Owner Been Notified?				
	56.	If Yes to 50 Above, Have State and Local Reporting				
		Requirements Been Met?				
	57.	If Yes to 50 Above, Were Intrusive Activities Curtailed Until;				
		Inspection From Utility Owner, Orientation and Depth of				
		Utility Was Determined and Marked, Permission From				
		Emergency Responders Given?				
	58.					
		Been Completed?				
		(Include Photographs)				
CHECKLIST COM	PLET	ED BY:				
NAI	ME	SIGNATURE	_			DATE
1 11 22						

(merade i notogra	5113)		
CHECKLIST COMPLETED BY:			
NAME	SIGNATURE	DATE	
NAME	SIGNATURE	DATE	

EHS 4-1: Bloodborne Pathogens

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 12/28/1999

Purpose: The purpose of this program is to define the requirements for working with potential bloodborne pathogens and to provide a

written Exposure Control Plan (ECP) to minimize or eliminate an employee's potential exposure to bloodborne pathogens. The ECP has been prepared to comply with the Occupational Safety and Health Administration (OSHA) regulation for

Skip Parry

Bloodborne Pathogens, 29 Code of Federal Regulations (CFR) 1910.1030.

Version Date:

01/05/2000 - Revised **Original Issue Date:** 02/01/95

Category: Company Procedures Sections: ESQ - Environmental Health & Safety Programs

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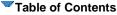
Category:

Keyword Training, Operational Control,

Index: Monitoring, EHS

Compliance/Waste Management

Approved By:



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1.0 PURPOSE

The purpose of this program is to define the requirements for working with potential bloodborne pathogens and to provide a written Exposure Control Plan (ECP) to minimize or eliminate an employee's potential exposure to bloodborne pathogens. The ECP has been prepared to comply with the Occupational Safety and Health Administration (OSHA) regulation for Bloodborne Pathogens, 29 Code of Federal Regulations (CFR) 1910.1030.



2.0 SCOPE

The program applies to all Tetra Tech EC, Inc. (TtEC) employees who may have occupational exposure to blood or other potentially infectious material.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Blood

Human blood, human blood components, and products made from human blood.



4.2 Bloodborne Pathogens

Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to the following:

- Hepatitis B Virus (HBV)
- Human immunodeficiency virus (HIV)



4.3 Contaminated

The presence, or the reasonably anticipated presence, of blood or other potentially infectious materials on an item or surface.



4.4 Contaminated Laundry

Laundry that has been soiled with blood or other potentially infectious materials, or may contain sharps.



4.5 Contaminated Sharps

Any contaminated object that can penetrate the skin including, but not limited to: needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.



4.6 Decontamination

The use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.



4.7 Engineering Controls

Controls that isolate or remove the bloodborne pathogens hazard from the workplace.



4.8 Exposure Incident

A specific eye, mouth, other mucous membrane, nonintact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.



4.9 Handwashing Facilities

A facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.



4.10 HBV

Hepatitis B Virus.



4.11 HIV

Human Immunodeficiency Virus.



4.12 Licensed Healthcare Professional

A person legally permitted to independently perform HBV vaccination and post exposure evaluation and follow-up.



4.13 Occupational Exposure

Reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.



4.14 Other Potentially Infectious Materials

All human body fluids, tissue, organs, or HIV/HBV-containing cultures or solutions.



4.15 Parenteral

Piercing mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, and abrasions.



4.16 Personal Protective Equipment

Specialized clothing worn by an employee for protection against a hazard.



4.17 Qualified Personnel

TtEC personnel currently certified in Basic First Aid, Cardiopulmonary Resuscitation (CPR), or similar certification assigned to conduct tasks involving potential exposure to bloodborne pathogens or other potentially infectious materials.



4.18 Regulated Waste

Liquid or semiliquid blood or other potentially infectious material; contaminated items that would release blood or other potentially infectious materials in a liquid or semiliquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.



4.19 Sharp

A sharp object contaminated with infectious material, (e.g., needles, broken glass) or anything that can pierce, puncture, or cut your skin.



4.20 Source Individual

Any living or dead individual whose blood or other potentially infectious materials may be a source of occupational exposure to the employee. This includes trauma victims.



4.21 Sterilize

The use of a physical or chemical procedure to destroy all microbial life, including highly resistant bacterial endospores.



4.22 Universal Precautions

An approach to infection control in which all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.



4.23 Work Practice Controls

Controls that reduce the likelihood of exposure by altering the manner in which a task is performed.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Environmental, Health and Safety Personnel

The Environmental and Safety Supervisor (ESS) or Environmental and Safety Coordinator (ESC) shall assist local operations management with the implementation of this program including provision for employee information and training.



5.1.2 Medical Providers

The TtEC local medical provider (LMP) and Corporate Medical Consultant (CMC) shall provide for administration of the HBV vaccine and post-exposure follow-up provisions of this program.



5.2 General Requirements

The TtEC Bloodborne Pathogen Program consists of identifying job classifications or tasks where potential occupational exposure to bloodborne pathogens may exist, and ensuring that an adequate ECP is implemented. The following sections describe the overall ECP for TtEC business operations. This plan may need to be supplemented with additional information in the site-specific EHS plans if the site job classifications or tasks are not adequately addressed by the ECP. Additionally, the ECP shall be reviewed and updated annually and whenever necessary to reflect new or modified tasks and procedures.

The primary elements of the ECP are:

- Exposure Determination;
- Control Methods, including use of universal precautions, engineering and work practice controls, personal protective equipment, and proper housekeeping and labeling;
- Hepatitis B (HBV) Vaccination;
- Post-Exposure Follow-Up;
- Employee Information and Training; and
- Recordkeeping.



5.3 Exposure Determination

The TtEC job classifications and tasks which may result in occupational exposure are:

First Aid and CPR Qualified Individuals - Tasks for this job classification include administration of first aid to individuals where exposure to blood or other potentially infectious materials could result. Only TtEC personnel currently certified in first aid and CPR, regardless of job classification or duties, shall perform first aid or CPR.

Investigation/Remediation Personnel at Infectious Waste Sites - Tasks for this job classification include air, soil and water sampling, waste handling and removal operations, and other duties at a site where direct contact with infectious waste occurs.

Other Job Classifications - Tasks for this job classification would include all tasks performed where there is an anticipated or actual exposure to blood or other potentially infectious materials. If applicable, a specific exposure determination by job classification and task shall be completed and included in the site-specific EHS plans.



5.4 Universal Precautions

Universal precautions, whereby human blood and certain human bodily fluids are treated as if known to be infectious, shall be used to prevent direct physical contact. These precautions include the use of barriers, isolation, personal protective equipment

(PPE), and first aid kits containing a mouth to mouth (artificial respiration) face shield when necessary. The most recent recommendations issued by the Center for Disease Control regarding universal precautions will be used as guidance.



5.4.1 Engineering and Work Practice Controls

Engineering and work practice controls shall be used to eliminate or minimize employee exposure. The policy of TtEC is to use these controls rather than PPE. PPE will be used only if engineering and work practice controls do not adequately control or eliminate occupational exposure.

Engineering controls used shall be examined on a monthly basis and maintained or replaced as necessary. Examples include the use of a sharps disposal container or specially marked bags for contaminated first aid materials.

Work practice controls, including handwashing, personal hygiene, and avoidance of sharps shall be implemented. The following work practice controls will be implemented as necessary at work sites where potential occupational exposure exists:

- Handwashing facilities shall be present on each job site. If provision of handwashing facilities is not feasible, then antiseptic handcleansers or toweletts must be used, followed by soap and running water as soon as possible.
- Employees shall wash hands immediately, or as soon as possible after removal of gloves or contact with blood or other potentially infectious materials.
- Eating, drinking, smoking, applying cosmetics, and handling contact lenses are prohibited in areas of potential exposure.
- Equipment that may have been contaminated with blood or other potentially infectious materials shall be examined and decontaminated, if feasible. If the equipment cannot be decontaminated it shall be labeled as a biohazard. Information regarding the biohazard shall be communicated to all handling, shipping, and service personnel.



5.4.2 Personal Protective Equipment

TtEC employees shall use, as directed, appropriate company-provided PPE. Appropriate PPE is that which does not permit blood or other potentially infectious materials to reach the employees clothes or body under normal conditions and duration of use.

PPE shall be provided, maintained, and properly disposed of at each work site where potential exposure exists. PPE shall be accessible at each work site and include hypo-allergenic gloves or other alternatives as necessary.

Potentially contaminated PPE shall be removed prior to exiting the work area. It shall be placed in a regulated container for disposal.

Appropriate gloves (e.g., latex and/or puncture resistant gloves) shall be worn when contact with blood or other potentially infectious materials is expected and when handling or touching contaminated items or surfaces.

Disposable gloves shall not be reused and shall be replaced if torn or punctured, or the ability to function as a barrier is compromised.

Surgical masks, in combination with eye protection (e.g., goggles or glasses with side shields) or face shield, shall be worn when splashes may result in eye, nose, or mouth contamination.



5.5 Housekeeping and Labeling

All equipment and environmental surfaces shall be cleaned and decontaminated after contact with blood or other potentially infectious materials.

Regulated waste shall be placed in containers that are closeable, constructed to prevent leaks, labeled with a biohazard label, and sealed prior to moving.

All contaminated laundry shall be disposed of as regulated waste or sent to a facility capable of handling infectious waste. Complete information regarding the nature of the waste and potential hazards shall be disclosed to the laundry facility.

All regulated waste containers shall be labeled with the "Biohazard" legend.



5.6 Hepatitis B Virus (HBV) Vaccination

All vaccinations shall be administered by the LMP or CMC using qualified personnel and procedures recommended by the U.S. Public Health Service.

The HBV vaccine and vaccination series shall be made available to all investigation/remediation workers at infectious waste sites, and other job classifications where contact with bloodborne pathogens or other infectious material is expected due to the routine nature of the job duties. The vaccination shall be made available after training and within 10 days of initial assignment to duties involving potential exposure unless the employee has already received the complete vaccination series, antibody testing demonstrates immunity, or medical reasons preclude it. This requirement will be specified in the site-specific EHS plan.

The HBV vaccine and vaccination series shall be made available to first aid and CPR qualified workers on a post-exposure basis only.

If declined, the HBV vaccine shall be made available as soon as possible, but in no event later than 24 hours following provision of first aid involving the presence of blood or other infectious materials regardless of whether an "exposure incident" has occurred. If an exposure incident has occurred, all required post exposure follow-up procedures shall be implemented. Additionally, any first aid incident must be reported to the ESS or ESC before the end of the work shift.

If any employee declines participation in the HBV vaccination series made available, they must acknowledge the declination on the TtEC Employee HBV Vaccine Declination Form (Attachment A). If an employee who has previously declined the vaccine, later requests the vaccine, the vaccine shall be provided at that time.



5.7 Post-Exposure Follow-Up

All TtEC employees included in the scope of this program are entitled to a confidential post-exposure evaluation and follow-up, following an "exposure incident." This includes prophylaxis, including a HBV vaccination within 24 hours of possible exposure.

All medical evaluations and procedures will be performed by or under the supervision of the LMP or CMC by a licensed health care professional in accordance with the recommendations of the U.S. Public Health Service. All laboratory tests shall be conducted by an accredited laboratory.

The post-exposure evaluation and follow-up shall consist of the following:

- Documentation of route of exposure and circumstances under which it occurred.
- Identification testing, and documentation of source individual if feasible and not prohibited by law. Testing of the source individual is not necessary if the individual is known to be infected with HBV/HIV. Results of source individual testing shall be made available to the exposed employee. The exposed employee will be informed of applicable disclosure laws.
- Collection and testing of blood. The exposed employee's blood will be collected as soon as possible after consent. If the employee consents to testing of blood, but does not give consent for HIV testing, the blood shall be held for 90 days. The employee may elect HIV testing during this time frame.
- Post exposure prophylaxis when necessary.
- Counseling.
- Evaluation of reported illness.

The LMP or CMC shall be provided with the following by the ESS or ESC:

- A copy of this program and the OSHA regulation, 29 CFR 1910.1030.
- Description of employee's duties related to the incidents.
- Documentation of route of exposure and circumstances under which the exposure occurred.
- · Results of source individual testing, if available.
- All appropriate medical records, including vaccination status (The CMC maintains this information for TtEC).

The written opinion of the LMP or CMC shall be provided to the TtEC employee within 15 working days of the evaluation. The opinion shall be limited to the following:

- Whether the employee should or has received the HBV vaccination.
- That the employee has been informed of the results.

• That the employee has been told of any medical conditions resulting from exposure that require further treatment.

All TtEC employee medical records shall be kept in accordance with the TtEC Medical Surveillance Program, EHS 4-5.



5.8 Employee Information and Training

Training shall be provided initially and annually thereafter to employees covered by the scope of this program. This includes qualified first aid personnel and site investigation/remediation personnel working at infectious waste sites, who have the potential for occupational exposure. Training will include the following:

- An accessible copy of 29 CFR 1910.103 and an explanation of its contents;
- A general explanation of the epidemiology and symptoms of bloodborne diseases;
- An explanation of the modes of transmission of bloodborne pathogens;
- An explanation of the employer's exposure-control plan and the means by which the employee can obtain a copy of the written plan;
- An explanation of the appropriate methods for recognizing tasks and other activities that my involve exposure to blood and other potentially infectious materials;
- An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment;
- Information on the types, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment;
- An explanation of the basis for selection of personal protective equipment;
- Information on the HBV vaccine, including information on its efficacy, safety, method of administration, and the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;
- Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;
- An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;
- Information of the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;
- An explanation of the signs and labels and/or color coding required by 29 CFR 1910.1030 (g)(1);
- An opportunity for interactive questions and answers with the person conducting the training session.

Note: Training may also be provided as site-specific training.



5.9 Recordkeeping

Medical records for affected employees shall include the following:

- Name, social security number, employee number;
- HBV vaccination status;
- · Copies of all medical examinations, testing, and followups;
- Physician's written opinion; and
- Copy of information provided to the physician.

Medical records are kept confidential and are not disclosed to anyone without written consent of the employee. Records are maintained for duration of employment plus 30 years.

Training records shall include the following:

- Date of training session;
- Contents or summary of training session;

• Names and qualifications of trainees; and

Records shall be maintained for three years from the date of training in accordance with Recordkeeping EHS 1-9. Availability of all records is in accordance with standard TtEC policy.



6.0 REFERENCES

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance SHA (U.S. Department of Labor, Occupational Safety and Health Administration) 29 CFR 1910.1030, Occupational Safety and Health Standards, General Industry.

United States Department of Labor, Office of Information USDL: 92-436, Mon., July 6, 1992.



7.0 ATTACHMENTS

Attachment A - Employee HBV Vaccine Employee Declination Form



Click the icon below to download and complete.



EHS 4-1 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

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- Counseling.
- Evaluation of reported illness.

The LMP or CMC shall be provided with the following by the ESS or ESC:

- A copy of this program and the OSHA regulation, 29 CFR 1910.1030.
- Description of employee's duties related to the incidents.
- Documentation of route of exposure and circumstances under which the exposure occurred.
- Results of source individual testing, if available.
- All appropriate medical records, including vaccination status (The CMC maintains this
 information for TtEC).

The written opinion of the LMP or CMC shall be provided to the TtEC employee within 15 working days of the evaluation. The opinion shall be limited to the following:

- Whether the employee should or has received the HBV vaccination.
- That the employee has been informed of the results.
- That the employee has been told of any medical conditions resulting from exposure that require further treatment.

All TtEC employee medical records shall be kept in accordance with the TtEC Medical Surveillance Program, EHS 4-5.

5.8 Employee Information and Training

Training shall be provided initially and annually thereafter to employees covered by the scope of this program. This includes qualified first aid personnel and site investigation/remediation personnel working at infectious waste sites, who have the potential for occupational exposure. Training will include the following:

- An accessible copy of 29 CFR 1910.103 and an explanation of its contents;
- A general explanation of the epidemiology and symptoms of bloodborne diseases;
- An explanation of the modes of transmission of bloodborne pathogens;
- An explanation of the employer's exposure-control plan and the means by which the employee can obtain a copy of the written plan;
- An explanation of the appropriate methods for recognizing tasks and other activities that my involve exposure to blood and other potentially infectious materials;
- An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment;

- Information on the types, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment;
- An explanation of the basis for selection of personal protective equipment;
- Information on the HBV vaccine, including information on its efficacy, safety, method of administration, and the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;
- Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;
- An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;
- Information of the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;
- An explanation of the signs and labels and/or color coding required by 29 CFR 1910.1030 (g)(1);
- An opportunity for interactive questions and answers with the person conducting the training session.

Note: Training may also be provided as site-specific training.

5.9 Recordkeeping

Medical records for affected employees shall include the following:

- Name, social security number, employee number;
- HBV vaccination status;
- Copies of all medical examinations, testing, and followups;
- Physician's written opinion; and
- Copy of information provided to the physician.

Medical records are kept confidential and are not disclosed to anyone without written consent of the employee. Records are maintained for duration of employment plus 30 years.

Training records shall include the following:

- Date of training session;
- Contents or summary of training session;
- Names and qualifications of trainees; and

Records shall be maintained for three years from the date of training in accordance with Recordkeeping EHS 1-9. Availability of all records is in accordance with standard TtEC policy.

6.0 REFERENCES

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping

Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance OSHA (U.S. Department of Labor, Occupational Safety and Health Administration) 29 CFR 1910.1030, Occupational Safety and Health Standards, General Industry. United States Department of Labor, Office of Information USDL: 92-436, Mon., July 6, 1992.

7.0 ATTACHMENTS

Attachment A - Employee HBV Vaccine Employee Declination Form

EHS 4-1 ATTACHMENT A EMPLOYEE HBV VACCINE EMPLOYEE DECLINATION FORM

Click the icon below to download and complete.



EHS 4-1 Attachment A.doc

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EHS 4-1 ATTACHMENT A

TETRA TECH EC, INC. EMPLOYEE HBV VACCINE DECLINATION FORM

I understand that due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring Hepatitis B virus infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine, at no charge to myself. However, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Employee Name (Print):		
Employee Signature:	 Date:	
Witness Name (Print):		
Witness Signature:	Date:	

EHS 4-2: Hazard Communication

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 03/01/2000

The purpose of this program is to ensure that employees understand the potential hazards of chemicals used in the Purpose:

workplace in accordance with the Hazard Communication Regulation (HAZCOM), 29 CFR 1910.1200.

Version Date:

04/04/2000 - Revised **Original Issue Date:** 02/01/95

Category: **Company Procedures** Sections: ESQ - Environmental Health & Safety Programs

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Approved By:



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1.0 PURPOSE

The purpose of this program is to ensure that employees understand the potential hazards of chemicals used in the workplace in accordance with the Hazard Communication Regulation (HAZCOM), 29 CFR 1910.1200.



2.0 SCOPE

This program applies to all Tetra Tech EC, Inc. (TtEC) operations where employees have potential exposure to hazardous chemicals as a result of their normal job duties or a foreseeable emergency. This program does not apply to hazardous wastes. However, TtEC will provide employees with information on the potential hazards of wastes in accordance with 29 CFR 1910.120 (e) and (i).



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Chemical Manufacturer

A work place where chemical(s) are produced for use or distribution.



4.2 Exposed Worker

Any worker subjected to a hazardous chemical in the workplace through any route of entry (inhalation, ingestion, skin contact, absorption, etc.).



4.3 Foreseeable Emergency

Any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that could result in an uncontrolled release of a hazardous chemical into the workplace.



4.4 Hazardous Chemical

Any chemical that constitutes a physical or health hazard. Chemicals with a label containing the words CAUTION, WARNING, or DANGER indicate the chemical is hazardous. Consumer products are not considered hazardous where it can be demonstrated that the products are used in the workplace in the same manner as for normal consumer use.



4.5 Material Safety Data Sheet (MSDS)

Written or printed material describing characteristics, hazards, and controls associated with a specific chemical or combination of chemicals.



4.6 Work Area

A room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Environmental, Health and Safety Personnel

The Environmental Health and Safety Supervisor (ESS) or Office Environmental and Safety Coordinator (ESC) shall ensure that:

- A list(s) of hazardous chemicals is developed for each work site or office;
- A current MSDS is maintained on file;
- MSDSs are available to employees; and
- Employees understand how to read an MSDS, know the location of the MSDSs and understand the potential hazards of the chemicals with which they are working.



5.1.2 Procurement

Procurement personnel are responsible for ensuring that:

- An MSDS is received with all new shipments of hazardous chemicals;
- Contacting the supplier when an MSDS is not received; and
- A copy of the MSDS is forwarded to the ESS or ESC.



5.2 General Guidelines

The HAZCOM regulation sets requirements for information and training on hazardous chemicals used in the work place. Federal law requires that all states comply with hazard communication regulations, and many states and local governments have adopted their own "equally or more stringent" hazard communication standards. Therefore, applicable state and local requirements must be consulted when conducting projects in states that have their own standards. The following are guidelines for complying with federal requirements.



5.3 Labeling

The HAZCOM regulation requires that the employer ensure the following:

- Each container of hazardous chemicals in the work place is labeled, tagged, or marked with the following information:
 - Identity of the hazardous chemical(s);
 - Appropriate hazard warnings; and
 - $-\mbox{ Name}$ and address of the chemical manufacturer, importer, or other responsible party.
- Existing labels on incoming containers of hazardous chemicals are not removed or defaced, unless the container is immediately marked with the required information.
- Labels or other forms of warning are legible, are in English, and are prominently displayed on the container, or readily available in the work area throughout each work shift.



5.3.1 Label Warning Systems

The types of common label warning systems are:

http://info.tteci.net/apps/groups/compliance/corpproc.nsf/d9055562b7654d27852572cf0... 6/19/2012

- 1. The National Fire Protection Association (NFPA) Standard defines five degrees of hazard in each of the following three categories: Emergency health hazard, fire hazard, and instability or reactivity hazard. NFPA warning labels are an acceptable means of labeling hazardous chemicals provided that employees are trained on the NFPA labeling system.
- 2. The Consumer Product Safety Commission requires precautionary labeling on every hazardous chemical intended for household use. Basic precautionary information and labeling terms have been identified by the Manufacturing Chemists Association including the following:
 - Toxic
 - · Highly toxic
 - Flammable
 - Extremely flammable
 - Corrosive
 - Irritant
 - Poison
- 3. The Department of Transportation (DOT) requires shipping containers of hazardous chemicals to be labeled in accordance with the appropriate hazard class. DOT has established nine hazard classes:
 - Explosives
 - Gases
 - Flammable liquids
 - Flammable solids
 - · Oxidizers/ Organic peroxide

- Poisons/infectious substances
- Radioactive materials
- Corrosives
- Miscellaneous hazardous materials

All TtEC projects shall use the name of the hazardous chemical and the NFPA system for labeling portable and stationary containers that are not appropriately labeled. This includes containers that are for general use (e.g., gasoline cans) and containers that have materials transferred to them from original containers.

"Prop 65" rules in California require special warnings when personnel may be exposed to substances "Known to the State" to be carcinogens or reproductive hazards. If materials which are subject to "Prop 65" are used at a California site, review the warnings referenced below during the HAZCOM portion of site-specific training. In addition, the Site Environmental, Health and Safety (EHS) plans will identify contaminants of concern that fall under "Prop 65".

- For exposure to a chemical known to the state to cause cancer:
 - "WARNING: This product contains a chemical known to the State of California to cause cancer."
- For exposure to a chemical known to the state to cause reproductive toxicity:
 - "WARNING": This product contains a chemical known to the State of California to cause birth defects or other reproductive harm."

.

5.3.2 Personal Responsibilities

Personnel using or handling any chemical shall complete the following steps when handling chemicals:

- 1. Read the label on the container. If special instructions are provided, they will usually be part of the label;
- 2. Look for information concerning special precautions for personal protection;
- 3. Note appropriate first aid in case of an exposure;
- 4. Become familiar with the various types of labels and their warnings; and
- 5. Consult the MSDS for further warnings or requirements.



5.3.3 Specific Labeling Requirements

Hazardous substances that have specific labeling requirements under other standards include the following:

Carcinogens

- Lead
- Asbestos
- Hydrogen, oxygen, and anhydrous ammonia
- Cotton dust
- Formaldehyde



5.4 Material Safety Data Sheets



5.4.1 General Information

The MSDS is used to relay chemical hazard information from the manufacturer/importer to the employer and employee. The HAZCOM regulation requires an MSDS for each hazardous material product an employee packages, handles, or transfers. The HAZCOM regulation does not require an MSDS sheet for hazardous wastes. Only those hazardous chemicals brought onto the job site by the contractor are required to have an MSDS sheet. However, the site-specific EHS plans will contain similar information on the known or potential site contaminants.



5.4.2 MSDS Contents

MSDSs that are received with incoming shipments of hazardous chemicals shall be maintained in an on-site file or office file by the ESS or ESC and shall be made available to all site or office employees. Each MSDS shall include the following information:

- Trade name of the chemical (if appropriate);
- Name, address, and telephone number for hazard and emergency information;
- Date of MSDS preparation;
- Chemical and common name of all ingredients;
- Occupational Safety and Health Administration (OSHA) permissible exposure limits, American Conference of Governmental Industrial Hygienists threshold limit values and other applicable limits;
- Physical and chemical characteristics;
- Physical hazards;
- Primary route(s) of entry into the body, such as inhalation, ingestion, or skin absorption;
- Acute and chronic health hazards, including signs and symptoms of exposure and medical conditions aggravated by exposure;
- Carcinogenic hazards;
- Emergency and first aid procedures;
- Precautions for safe handling and use; and
- Engineering/exposure control measures and personal protective equipment.

Attachment A provides an overview of the information contained in an MSDS.

Upon receipt of an MSDS (with a shipment of chemicals or otherwise) the following steps shall be performed:

- 1. The MSDS shall given to the ESS or ESC who inspects it for completeness. If incomplete, the MSDS is returned to the manufacturer with a request for a complete MSDS. Attachment B or an equivalent should be used to contact the supplier or manufacturer. After sending the letter the supplier or manufacturer should be contacted by phone.
- 2. If the MSDS is complete, the ESS or ESC places a copy of the complete MSDS into the site project or office file.

3. If a revised version of an MSDS is received, the old version of the MSDS is stapled to the revised MSDS and placed in the site project or office file.

If no MSDS is received with a shipment of chemicals Attachment B or an equivalent shall be used to request an MSDS from the supplier or the manufacturer. After sending the letter, the supplier or manufacturer should be contacted by telephone.

Copies of all correspondence, telephone contact and MSDSs shall be maintained in the project or office files.

MSDSs are a good source of information for those seeking quick hazardous material references. In the case of emergencies, however, not all of the pertinent information is provided and at times the information may be more damaging than helpful. Response to any emergency requires quick judgement calls. If there is any question of which first aid procedures to follow, it is best to call the emergency number provided on each MSDS specific to the material in question.



5.5 Non-Routine Activities

All TtEC employees and subcontractors must be informed of the hazards associated with chemicals involved in non-routine activities. For the purpose of this guideline, non-routine activities include, but are not limited to, line breaking/pipe opening, confined space entry, tank cleaning, and other maintenance of process equipment.

Hazards of non-routine tasks are addressed in site-specific EHS plans and Activity Hazard Analyses and are reviewed with the work crew during phase preparatory meetings or daily briefings.



5.6 Employee Information and Training

Employee information and training shall be provided as part of the employee's EHS training. This documentation includes the initial hazardous waste training certificate and site-specific or office training documentation.

The following are required elements of the information and training program:

- An overview of HAZCOM;
- A review of any operations in their work areas that involve hazardous materials;
- The location and availability of the written Hazard Communication Program, including the list(s) of hazardous chemicals and MSDSs:
- Methods and observations that may be used for detecting the presence or release of hazardous chemicals;
- An understanding of the physical and health hazards of hazardous chemicals in the work area;
- How to understand the information in MSDSs;
- How to read the warnings on container labels including the NFPA system;
- When and how to report leaks and spills;
- How to recognize the symptoms of overexposure and how to protect against it; and
- How to implement exposure control methods including work practices, engineering controls, administrative controls, personal protective equipment, and emergency procedures.

Hazard communication training is provided during initial training, site-specific and office orientation, supervisor training, and 8-hour refresher training as specified in EHS 1-11, Training. Attachment C or an equivalent may be used to document training and ensure training is in compliance with the Hazcom regulations.

In the event that a new chemical hazard or new task is introduced in the workplace, the ESS or ESC shall conduct additional training that includes the following:

- Objectives of the task, if applicable;
- Physical and health hazards associated with the new chemical hazard or task;
- Methods to detect the presence or release of the hazardous chemicals:

- Procedures and practices recommended to protect themselves from the hazards;
- Emergency procedures in the event of a hazardous situation or exposure; and
- Location and availability of the written program, lists of chemicals, and MSDS.

Documentation is maintained for each employee trained in hazard communication in accordance with EHS, 1-9, Recordkeeping.



5.7 Subcontractors

Subcontractors working for TtEC shall be required to meet the EHS requirements outlined in their contracts. To help meet these requirements, subcontractors are informed of TtEC procedures by the ESS and instructed on where to find information on hazardous chemicals being used on the project.



6.0 REFERENCES

29 CFR 1910.1200, Hazard Communication.
49 CFR 100-181, Hazardous Materials Transportation.
Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping Environmental, Health & Safety - Programs Procedure EHS 1-11, Training COSHA (U.S. Department of Labor, Occupational Safety and Health Administration) U.S. Department of Transportation (DOT)



7.0 ATTACHMENTS

Attachment A - MSDS Overview
Attachment B - MSDS Letter to Supplier or Manufacturer
Attachment C - Hazard Communication Checklist



EHS 4-2 ATTACHMENT A

MSDS OVERVIEW

Click the icon below to launch or download.



EHS 4-2 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



EHS 4-2 ATTACHMENT B

MSDS LETTER TO SUPPLIER OR MANUFACTURER

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EHS 4-2 Attachment B.doc

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EHS 4-2 ATTACHMENT C

HAZARD COMMUNICATION CHECKLIST

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EHS 4-2 Attachment C.doc

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5.6 Employee Information and Training

Employee information and training shall be provided as part of the employee's EHS training. This documentation includes the initial hazardous waste training certificate and site-specific or office training documentation.

The following are required elements of the information and training program:

- An overview of HAZCOM;
- A review of any operations in their work areas that involve hazardous materials;
- The location and availability of the written Hazard Communication Program, including the list(s) of hazardous chemicals and MSDSs;
- Methods and observations that may be used for detecting the presence or release of hazardous chemicals:
- An understanding of the physical and health hazards of hazardous chemicals in the work area;
- How to understand the information in MSDSs;
- How to read the warnings on container labels including the NFPA system;
- When and how to report leaks and spills;
- How to recognize the symptoms of overexposure and how to protect against it; and
- How to implement exposure control methods including work practices, engineering controls, administrative controls, personal protective equipment, and emergency procedures.

Hazard communication training is provided during initial training, site-specific and office orientation, supervisor training, and 8-hour refresher training as specified in EHS 1-11, Training. Attachment C or an equivalent may be used to document training and ensure training is in compliance with the Hazcom regulations.

In the event that a new chemical hazard or new task is introduced in the workplace, the ESS or ESC shall conduct additional training that includes the following:

- Objectives of the task, if applicable;
- Physical and health hazards associated with the new chemical hazard or task;
- Methods to detect the presence or release of the hazardous chemicals:
- Procedures and practices recommended to protect themselves from the hazards;
- Emergency procedures in the event of a hazardous situation or exposure; and
- Location and availability of the written program, lists of chemicals, and MSDS.

Documentation is maintained for each employee trained in hazard communication in accordance with EHS, 1-9, Recordkeeping.

5.7 Subcontractors

Subcontractors working for TtEC shall be required to meet the EHS requirements outlined in their contracts. To help meet these requirements, subcontractors are informed of TtEC procedures by the ESS and instructed on where to find information on hazardous chemicals being used on the project.

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7.0 ATTACHMENTS

Attachment A - MSDS Overview

Attachment B - MSDS Letter to Supplier or Manufacturer

Attachment C - Hazard Communication Checklist

MSDS OVERVIEW

Click the icon below to launch or download.



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EHS 4-2 ATTACHMENT B

MSDS LETTER TO SUPPLIER OR MANUFACTURER

Click the icon below to launch or download.



EHS 4-2 Attachment B.doc

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EHS 4-2 ATTACHMENT C

HAZARD COMMUNICATION CHECKLIST

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EHS 4-2 ATTACHMENT A

TETRA TECH EC, INC. MATERIAL SAFETY DATA SHEET OVERVIEW

The following is provided to aid in the understanding of a typical Material Safety Data Sheet (MSDS). The actual format of the MSDS may vary.

Section I gives the identity of the chemical as it is on the label. Included is the name and address of the company that makes or imports the chemical, the emergency phone numbers to call for emergency or additional information, and the date the MSDS was prepared.

Section II shows where you will find the hazardous component, chemical identification, and common names. Worker exposure limits to the Occupational Safety and Health Administration permissible exposure limits and American Conference of Governmental Industrial Hygienists threshold limit values and other recommended safe exposure limits are included. Even if the chemical makeup is a trade secret the safety precautions are still given.

Section III describes the physical and chemical characteristics of the hazardous chemical, which can be complicated. If there is uncertainty, a supervisor or a glossary of common terms should be consulted for a better understanding of how the items could effect you in different work situations.

- The boiling point and melting point is where a liquid at a certain temperature will change from liquid to breathable gas.
- Vapor pressure, vapor density, and evaporation rate are especially important for toxic gases and vapors.
- Solubility in water and specific gravity tells you if a chemical will dissolve in water, sink or float.

Section IV helps judge the risk of fires and explosions. The flash point refers to the minimum temperature needed to initiate explosive conditions. Flammability limits indicate the concentration of the substance in the form of a gas or vapor that is needed for the gas or vapor ignite. It also gives instructions as to what to use (e.g., water, C02 foam) to put out a fire and any special hazards associated with the fire fighting procedures.

Section V reveals the reactivity of the chemical, i.e., under what conditions it is stable or not stable. The data indicate how possible reactions may be reduced and describes spill prevention and storage precautions.

Section VI describes the chemical's primary route(s) of entry into the body (e.g., inhalation, ingestion) and presents exposure symptoms (e.g., headaches, nausea, dizziness and rashes). Some effects occur right after exposure (e.g., a skin bum), while others have long-term or chronic effects (e.g., cancer). It also tells of existing conditions such as asthma that can be made worse by exposure to the chemical. Lastly, first aid procedures are offered should you be exposed and become ill or injured.

Section VII provides precautions for a safe handling and use of the chemical, explaining what to do if there is a spill, leak, or any accidental release, the waste disposal methods to be taken, and any precautions in the handling and storage of the chemical.

Section VIII describes the protective clothing and equipment (e.g., respiratory, gloves, eye protection) that should be used with the chemical as well as the appropriate work/hygienic practices.

Many of the terms used in MSDSs can be abbreviated and are technical in nature. A glossary of common terms used in MSDSs can be used as an aid in comprehension.

EHS 4-2 ATTACHMENT B MSDS LETTER TO SUPPLIER OR MANUFACTURER



Date

Manufacturer Name Street Number
City, State Zip Code
Dear Sirs:
We recently received a shipment of chemicals from your firm that was deficient in the following:
No Material Safety Data Sheet (MSDS) was present for the chemicals received.
The MSDS received did not contain adequate information as follows.

Listed below are the products requiring the above information. Pursuant to 29 CFR 1910.1200, I respectfully request that the appropriate MSDS for these items be sent to the above address, marked to my attention. Your cooperation is greatly appreciated.

Sincerely,

TETRA TECH EC, INC.

ESS or ESC Title

EHS 4-2 ATTACHMENT C

TETRA TECH EC, INC. HAZARD COMMUNICATION CHECKLIST

Project	/Off	ice Name:
Locatio		Date:
Form C	Comp	pleted By:
	1.	Have we prepared a list of all the hazardous chemicals in our workplace?
2	2.	Are we prepared to update our hazardous chemical list?
	3.	Have we obtained or developed a material safety data sheet (MSDS) for each hazardous chemical we use?
	4.	Have we developed a system to ensure that all incoming hazardous chemicals are checked for proper labels and MSDS?
	5.	Do we have procedures to ensure proper labeling or warning signs for containers that hold hazardous chemicals?
	6.	Are our employees aware of specific information and training requirements of the Hazard Communication Standard?
	7.	Are our employees familiar with the different types of chemicals and the hazards associated with them?
	8.	Have our employees been informed of the hazards associated with performing nonroutine tasks?
	9.	Do our employees understand how to detect the presence or release of hazardous chemicals in the workplace?
	10.	Are employees trained about proper work practices and personal protective equipment in relation to the hazardous chemicals in their work areas?
	11.	Does our training program provide information on appropriate first aid, emergency procedures, and the likely symptoms of overexposure?
	12.	Does our training program explain the types of labels and warnings used in each work area?
	13.	Does the training describe where to obtain data sheets and how employees may use them?
	14.	Have we worked out a system to ensure that new employees are trained before beginning work?
	15.	Have we developed a system to identify new hazardous chemicals before they are introduced into a work area?
	16.	Do we have a system for informing employees when we learn of new hazards associated with a chemical we use?

EHS 4-4: Hearing Conservation

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 11/16/2009

The purpose of this procedure is to establish the Tetra Tech EC, Inc. (TtEC) Hearing Conservation Program to prevent Purpose:

hearing loss from on-the-job noise exposure and to comply with the requirements of Occupational Safety and Health

Administration (OSHA) 29 CFR 1910.95 and 29 CFR 1926.52 regulations for occupational noise exposure.

Version

11/16/2009 - Revised

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Date:

Company Procedures

Sections: ESQ - Environmental Health & Safety Programs

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Departmental/Discipline

Document Type: Procedure

Category:

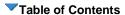
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1.0 PURPOSE

The purpose of this procedure is to establish the Tetra Tech EC, Inc. (TtEC) Hearing Conservation Program to prevent hearing

loss from on-the-job noise exposure and to comply with the requirements of Occupational Safety and Health Administration (OSHA) 29 CFR 1910.95 and 29 CFR 1926.52 regulations for occupational noise exposure.

2.0 SCOPE

This procedure applies to all TtEC field or construction operations.

3.0 MINIMUM REQUIREMENTS

3.1 Definitions

Audiogram - A chart, table or graph resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

dB (A) (A-Weighted Sound Level Scale) - A quantity, in decibels, read from a standard sound level meter that is switched to the weighting network labeled "A." The A-weighted sound level measures the approximate relative "noisiness" of a given environment.

Decibel - The unit in which the levels of various acoustical quantities are expressed. Typical quantities so expressed are sound pressure level, noise level.

Exchange Rate - (also known as dose-trading relation, or doubling rate). When sound levels increase, the allowed exposure time must be decreased. The exchange rate is the amount by which the permitted sound level may increase if the exposure time is halved. OSHA uses a 5 db (A) exchange (or doubling) rate, NIOSH and ACGIH use a 3 db (A) exchange rate.

Hearing Loss - At a specified frequency, an amount, in decibels, by which the individual's hearing acuity is less than the selected norm.

Noise Reduction Rating (NRR) - A rating given to a hearing protector to assess the noise attenuation capability.

Permissible Exposure Level - PEL - refers to the sound pressure levels and exposure duration established by the USDOL-OSHA under 1910.95 and 1926.52 to which workers may be exposed.

Standard Threshold Shift - A change in the hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2,000, 3,000, and 4,000 Hertz (Hz), in either ear. A Confirmed Shift caused by noise exposure is considered to be an OSHA recordable.

Threshold Limit Values - TLV refer to the sound pressure levels and durations of exposure that represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect on their ability to hear and understand normal speech.

3.2 Responsibilities

3.2.1 Line Management

Site Supervisors are responsible for:

- Ensuring that hearing protection is both worn and worn in the proper manner when required.
- Including consideration of noise operation and operator protection when obtaining construction heavy equipment and other tools.

3.2.2 Project Environmental Safety Manager (PESM)

The PESM is responsible for:

- Proving technical support and oversight to the Health and Safety Officer/Environmental Safety Supervisor (HSO/ESS).
- Ensuring that the HSO/ESS has adequate training and experience to perform noise monitoring and hearing conservation duties.
- Ensuring that confirmed Standard Threshold Shifts (STS) are recorded on the OSHA 300 log.

3.2.3 HSO/ESS

- Verifying that site employees are trained and have audiometric examinations prior to the start of work;
- Providing hearing protection to workers and ensuring proper fitting of hearing protection devices;
- Posting high noise warning and hearing protection signs in affected areas;
- Conducting exposure monitoring of high noise areas;

- Providing information to workers on the hearing conservative program;
- Monitoring personnel or representative individuals to determine noise exposures, when activity or equipment changes
 occur;
- Maintaining site hearing conservation program records;
- Overseeing the requirements of the hearing conservation program at the site;
- Informing the PESM and affected workers of any overexposures identified during monitoring;
- Evaluating and Selecting Hearing Protection equipment, assuring an appropriate selection is available to workers;
- Initiating an Event Report in accordance with EHS 1-7 when a <u>STS</u> of greater than 10 dB (A) in either ear has been reported by the Corporate Medical Consultant (CMC);
- Notifying affected employees and the PESM of a STS upon notification by the CMC.

3.2.4 Medical Personnel

The Corporate Medical Consultant (CMC) is responsible for:

- Determining if a STS has occurred when reviewing the audiometric examination results;
- Providing Director, Health and Safety with an annual summary of STSs which occurred to TtEC employees;
- Conducting audiometric testing, reviewing results, <u>maintaining quality control over contractor audiometric test booth</u> <u>performance in accordance with 1910.95 and</u> maintaining records of audiometric tests; and
- Notifying the HSO/ESS if an STS is observed.

4.0 PROCEDURES

4.1 Applicable Regulations

Unless noted otherwise, this procedure implements the OSHA 29 CFR 1910.95 and 1926.52 requirements.

4.2 Hearing Conservation Program

TtEC will maintain a Hearing Conservation Program for employees who are exposed to noise levels in excess of the action level (85 dB (A). Engineering and/or administrative methods to maintain worker exposure below the action level will be used whenever feasible. Whenever these control methods are not feasible, employees are included in the Hearing Conservation Program which includes noise exposure monitoring, audiometric testing, use of hearing protective devices, and employee training and access to information and recordkeeping.

4.3 Action Level

The action level is a noise exposure level equal to or greater than an 8-hour time weighted average (TWA) of 85 dB (A) slow response, 5 dB (A) exchange rate, or a dose equivalent of 50% as measured by a noise dosimeter without regard to any attenuation provided by the use of personal protective equipment.

4.4 Hearing Protection

Hearing protection will be required when employee exposure exceeds the action level or while using equipment resulting in a noise exposure in excess of 90 dB (A), or when working in areas where warning signs indicate that the use of hearing protection is required. Workers must always use hearing protection when noise levels exceed 115 dB (A).

Whenever hearing protection is required workers will be offered a choice between one or two types of ear plugs and one type of ear muffs. All hearing protectors used must meet the noise attenuation requirements for the exposure.

The adequacy of hearing protection used will be evaluated by the ESS or designee.

4.5 Exposure Monitoring

Noise exposure monitoring shall be conducted when information indicates that an employee's exposure may be equal to or greater than the action level.

Monitoring shall be conducted in accordance with the TtEC EHS Field Procedures Guides HSG1-5, Noise Monitoring, including the following components:

- The identity of all workers that may be exposed to noise at or above the action level.
- Area monitoring or representative personal monitoring. Personal Monitoring (noise dosimetry) will be used when area
 monitoring is not feasible due to worker mobility sound levels varying over time, or significant impulse noise exists.
- All continuous, intermittent, and impulsive sound levels between 80 and 130 dB(A) will be integrated into noise
 measurement.

- The use of properly calibrated instruments.
- Repeat monitoring whenever workplace changes occur that may result in increased personnel exposure or render protective equipment inadequate.
- Employee notification if they are exposed at or above the action level.
- The opportunity for affected workers to observe exposure monitoring measurements.

4.6 Audiometric Testing

Audiometric testing will be provided to workers included in the Hearing Conservation Program. All such identified employees will undergo baseline and annual audiometric testing.

For the baseline audiometric testing, workers must be preceded by 14 hours without exposure to workplace noise (hearing protection may be used for a substitute for the 14 hour period). Workers will avoid high levels of non-occupational noise during the 14 hour period immediately preceding the audiometric examination.

General Requirements

Audiometric tests will be performed using qualified personnel meeting the requirements of 29 CFR 1910.95 (g) and (h).

Audiometric testing equipment will be operated and meet the requirements of 29 CFR 1910.95, Appendix C, *Audiometric Testing Instruments*, Appendix D, *Audiometric Test Rooms*, and Appendix E, *Acoustic Calibration of Audiometers*.

Baseline Audiogram. A baseline audiogram will be established for employees exposed above the action level within six months of exposure. The baseline audiogram forms the basis for comparison to subsequent audiograms.

Annual Audiogram. An audiogram will be repeated at least annually for affected employees. Results are compared to the baseline audiogram by the CMC to determine validity and any shifts in employee hearing acuity.

Procedure for Standard Threshold Shift. If an STS is observed, the affected employee will be retested within 30 days and the results reviewed by an audiologist, otolaryngologist, or qualified practitioner to determine if further evaluation is needed.

If an STS has occurred, the following actions will be taken:

- 1. The HSO/ESS informs the employee in writing of the condition within 21 days of receipt of results, informs the PESM, who ensures that the case is recorded on the OSHA 300 log as a recordable illness. A copy of the physician's report is furnished to the employee.
- 2. The individual is trained in the use and care of one or more hearing protective devices, is fitted for one or more devices, and is required by the ESS to wear the device(s) when on the job. If the employee already wears protective devices, retraining and refitting will be provided, and if necessary a more efficient device or devices will be supplied.
- 3. Additional testing may be advised if a medical pathology of the ear occurs, particularly if wearing hearing protection is suspected of causing the condition.
- 4. An annual audiogram will be substituted for the baseline audiogram when a threshold shift is persistent or there is significant hearing improvement.

4.7 Employee Training

Employees included in the Hearing Conservation Program shall receive hearing conservation training initially and at least annually. Training will consist of the following:

- Effects of noise on hearing;
- Purpose of hearing protectors;
- Advantages and disadvantages of various types of hearing protection;
- Instructions for selecting, fitting, using, and caring for hearing protection devices;
- Purpose of audiometric testing; and
- Explanation of audiometric test procedures;
- · Results of recent area noise surveys

4.8 Noise Reduction

Engineering controls must be applied whenever possible to reduce or eliminate noise for the workplace. Engineering controls include the use of silencers, mufflers, sound barriers, dampers, isolators. Administrative controls include moving worker activities away from high noise sources and limiting the time in a high noise area (worker rotation).

4.9 Hearing Protection

Hearing Protection will be used when noise levels or a reduction in exposure time are not feasible.

4.10 Warning Signs

Warning signs indicating the presence of a high noise area and the requirement to wear hearing protection will be visibly posted and enforced at the work location whenever ambient noise level exceeds 85 dB (A).

4.11 Recordkeeping

Audiometric Testing Records. An accurate record of all audiometric testing in accordance with the 29 CFR 1910.95(m) is maintained by the CMC in the employee's medical record.

Exposure Records. Records of noise exposure monitoring are maintained in the project EHS records in accordance with EHS 1-9, Recordkeeping for a minimum of two years. The CMC will maintain the individual records for the 30 years required by OSHA.

Training Records. Hearing Conservation Program training records are maintained in the project EHS records by the ESS and in the employee EHS records by the Director, Health and Safety. Records will be maintained in accordance with EHS 1-9, Recordkeeping.

4.12 Government Contracts

Most government contracts have more stringent requirements as follows:

- <u>United States</u> Army Corps of Engineers (<u>USACE</u>) Military related contracts must implement EM 385 1-1 Section 0.5C, which generally implements American Conference of Governmental Industrial Hygienist (ACGIH) controls.
- <u>United States</u> Department of Energy The <u>USDOE</u> sites are directly subject to ACGIH control levels.



5.1 Background

Occupational Noise Exposure for construction is addressed in 29 CFR 1926.52 and General Industry is addressed in 29 CFR 1910.95. OSHA has maintained that Construction is covered by the less detailed 1926 standards; however, interpretations provided over the years on 1926 have referred back to the 1910 standards, such as for Hearing Conservation Programs.

The major differences between the OSHA standards, and the standards required for government contracts are the thresholds at which certain actions occur. The OSHA generally uses higher thresholds, including a 5 dB doubling rate. Government contracts use a 3 dB doubling rate. A comparison of the two systems is provided in Tables 1, 2 and 3. Table 3 also provides National Institute of Occupational Safety and Health (NIOSH) guidance.

Several states have also adopted some or all of the ACGIH recommendations. States have also imposed additional requirements, such as quarterly hearing protection audits that may be applicable.

Users should be aware of the standard(s) that are applicable to their project, and consult with their PESM to ensure that appropriate requirements are addressed.

5.2 Hearing Protection Noise Reduction Determinations

Noise Reduction Rating (NRR) factors should be adjusted for field use. The NRR are determined in a laboratory, and typically, 7 dB (A) is subtracted to adjust to field use, and the remainder subtracted to determine the estimated exposure under the hearing protection (Example: An area has a measured noise level of 90 dB (A). An earplug indicates a NRR of 22. Subtract 7 dB to correct for field use. The remainder (15 dB) is the reduction that can be applied, resulting in a exposure of 75 dB (A). The highest NRR on earplugs is about 33.

If earplugs or earmuffs alone do not provide adequate protection, they may be used together as dual hearing protection. If dual protection is used, use the highest NRR of the two devices, subtract 7 dB (A) from that NRR, add 5 dB (A) to the resultant NRR and subtract this from the A-weighted TWA to determine the protected TWA (Example - an area has a noise level of 98 dB (A). Earplugs with a NRR of 32 are planned, with earmuffs having a NRR of 15. Subtracting 7 from 32 dB equals 25, plus 5 dB from the additional protection of the earmuffs equals a TWA reduction of 30 dB, reducing the TWA noise level to 68 dB).

Calculated values reflect realistic values only to the extent that the protectors are properly fitted and worn. NIOSH has proposed NRR reductions of hearing protectors (25% for muffs, 50% for formable earplugs, and 70% for other ear plugs). Consult with the PESM for the appropriate NRR adjustments.

Devices that do not have a NRR will not be allowed for use as hearing protection (e.g., AM/FM earmuffs, white noise muffs, entertainment type earbuds, earphones, and similar.

5.3 Additional Information

29 CFR 1910.95, Occupational Noise Exposure (General Industry) requires a copy of the OSHA standard will be provided to affected employees upon request and posted at locations where the action level for noise is exceeded.

Noise reduction efforts - For heavy equipment, projects should consider "buy quiet" programs when purchasing or renting equipment. Selecting equipment that operates quieter, or has an operator cab meeting newer ANSI standards will often eliminate the need to wear hearing protection and increase worker productivity.

Noise measurements in the area or under typical work conditions should be conducted to determine the noise levels, and durations. Worker Exposures above the TWA or action level indicate that hearing protection is required. Hearing protection should be selected and matched to the conditions. Using low protection will result in worker exposure over the TWA and eventual hearing loss. Using too high a protection will result in workers not being able to hear warnings, radio communications, etc. without removing the protection and exposing themselves unprotected to the ambient noise.

6.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column	
1. 29 CFR 1910.95, Occupational Noise Exposure and Appendices	http://www.osha.gov/pls/oshaweb/owadisp.show_document? p_table=STANDARDS&p_id=9735	
2. 29 CFR 1926.52, Occupational Noise Exposure	http://www.osha.gov/pls/oshaweb/owadisp.show_document? p_table=STANDARDS&p_id=10625	
3. 29 CFR.1926.101, Hearing Protection	http://www.osha.gov/pls/oshaweb/owadisp.show_document? p_table=STANDARDS&p_id=10625	
4. 2009 TLV and BEIs (American Conference of Governmental Industrial Hygienists	To Order: www.acgih.org/	
5. EHS 1-9, Recordkeeping	a	
6. HSG1-5, Noise Monitoring	a	
7. EHS 1-7, Event Reporting and Investigation	C	
8. U.S. Army Corps of Engineers Safety & Health Requirements Manual (EM-385-1.1, September 2008, Section 0.5C	http://www.usace.army.mil/publications/eng- manuals/em385-1-1/c-5.pdf	
9. National Institute for Occupational Safety and Health (NIOSH)		

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7.0 TABLES

Table 1 - Noise Exposure Limits When TWA Level = 90 dB (A)		
3 dB (A) Exchange Rate Allowable Level dB (A)	Maximum Permitted Daily Duration (hours)	5 dB (A) Exchange R Allowable Level dB (
90	8	90
93	4	95
96	2	100

99	1	105
102	0.5	110
105	0.25	115

Table 2 - Noise Exposure Limits When TWA Level = 85 dB (A)

3 dB (A) Exchange Rate Allowable Level dB (A)	Maximum Permitted Daily Duration (hours)	5 dB (A) Exchange R Allowable Level dB (
85	8	85
88	4	90
91	2	95
94	1	100
97	0.5	105
100	0.25	110

Table 3 - Summary Comparison of Requirements and Recommendations

Agency	<u>ACGIH</u>	<u>NIOSH</u>	<u>OSHA</u>	USDOE ar
Requirement or Recommendation	Recommendation	Recommendation	Requirement	Requir
Exchange Rate	<u>3</u>	<u>3</u>	<u>5</u>	3
Threshold	85 for 8 hours; the allowable TLVs for noise range from 80 dB for a 24 hour period to 139 dB for 0.11 seconds	85 for 8 hours; an 8 hour Time Weighted Average (TWA) of 85 dB	90 for 8 hours; the allowable PELs for noise range from 8 hours at 90 dB* to 115 dB for 0.25 hours	85 for 8 hours allowable TL' range from 8 hour period to 0.11 seconds
Impulse/Impact noise	<u>140 dB</u>	<u>N/A</u>	140 dB peak	<u>140</u>
Action Level to Trigger Hearing Conservation Program	<u>85dB</u>	<u>85dB</u>	<u>85dB</u>	<u>85</u>
Attenuation	Hearing protection must be able to attenuate the exposure to a TWA of 85 dB	Hearing protection must be able to attenuate the exposure to a TWA of 85 dB	Hearing protection must be able to attenuate the exposure to a TWA of 90 dB or to 85 dB for those with a standard threshold shift/not had a baseline evaluation	Hearing prote be able to att exposure to a dB
Sound level for mandatory use of hearing protection	<u>90dB</u>	<u>85dB</u>	<u>90dB</u>	90
Voluntary use of hearing protection	<u>N/A</u>	<u>N/A</u>	<u>85 dB</u>	<u>N</u>

^{*}All dB weightings are A scale unless otherwise noted.

Tetra Tech EC, Inc.

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Proprietary Information

EHS 4-5: Medical Screening and Surveillance

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 11/13/2008

The purpose of this program is to ensure that the Tetra Tech EC, Inc. (TtEC) medical screening and surveillance program Purpose: addresses the needs of TtEC personnel, employee medical records are up-to-date and properly maintained, and that the

TtEC medical surveillance program meets the requirements of applicable regulations.

Version 10/10/2008 - New Original Issue Date: 02/01/95

Date:

Category: Company Procedures Sections: ESQ - Environmental Health & Safety Programs

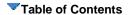
Sub Departmental/Discipline **Document Type:** Procedure

Category:

Keyword Monitoring, Operational Control, **Document Owner:** Skip Parry

Index:

Approved By:



1.0 PURPOSE

2.0 SCOPE

3.0 MINIMUM REQUIREMENTS

4.0 GUIDANCE

5.0 REFERENCES

6.0 ATTACHMENTS



1.0 PURPOSE

The purpose of this program is to ensure that the Tetra Tech EC, Inc. (TtEC) medical screening and surveillance program addresses the needs of TtEC personnel, employee medical records are up-to-date and properly maintained, and that the TtEC medical surveillance program meets the requirements of applicable regulations.



2.0 SCOPE

This program applies to medical examinations and biological monitoring provided to TtEC personnel included in the TtEC medical screening and surveillance program. It is assumed all medical exams/tests necessary for a given project/site have been identified by a Project Environmental and Safety Manager (PESM).



3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Director, Environmental, Safety & Quality (ESQ)

The Director, Environmental, Safety and Quality (ESQ) Services is responsible for updating this procedure.

The Director, ESQ shall periodically review the quality assurance and quality control program of the Corporate Medical Consultant (CMC). The Director, ESQ will also review and consider feedback from project or office managers, Environmental, Health and Safety (EHS) personnel, contracts personnel, Local Medical Providers (LMPs), and others when conducting reviews of the CMC.

3.1.2 Environmental, Health and Safety Personnel

http://info.tteci.net/apps/groups/compliance/corpproc.nsf/d9055562b7654d27852572cf0...

The PESM assists in implementation of the program at TtEC offices and projects. The PESM assists the Environmental and Safety Supervisor (ESS) in defining additional medical surveillance parameters or biological monitoring for projects.

The ESS is responsible for ensuring that personnel working on a project have the required medical surveillance examinations and have current documentation of a qualified physician's opinion approving the worker for hazardous waste site work, asbestos work, and respirator qualification, as necessary.

3.1.3 Corporate Medical Consultant (CMC)

The CMC will be Board Certified in Occupational Medicine and will:

- Provide consultation to Director, ESQ regarding all aspects of the TtEC medical surveillance program;
- Manage the day-to-day operation of the program;
- Quality Local Medical Providers (LMPs);
- Review the work of the LMPs and perform selected clinic audits;
- Provide input to project specific medical surveillance parameters, as requested;
- Provide periodic status reports of the TtEC Medical Surveillance program to the Director, ESQ;
- Review and approve the fitness for duty for each TtEC employee as requested;
- Maintain all employee medical and exposure records;
- Notify the TtEC Director, ESQ of all requests for medical information;
- Develop, maintain and implement a quality assurance/quality control program.

3.2 Information Provided To The CMC

The Director, ESQ ensures that the CMC receives the following information required by the Occupational Safety and Health Administration (OSHA):

- Copies of OSHA 29 CFR 1910.120 and other applicable regulations;
- Copies of applicable EHS plans for the hazardous waste sites or other work locations, as requested;
- A copy of TtEC's medical surveillance program protocols and procedures; and
- Copies of personal exposure monitoring data or appropriate employee exposure data;
- Access to the job site if requested

The PESM shall ensure that the CMC receives project-specific medical surveillance requirements in advance of examination scheduling.

3.3 Scheduling of Initial Medical Surveillance Examinations

Exams are scheduled for those working on projects requiring medical clearance or initial testing per CFR 1910.120, contract or ES&H Plan. EHS personnel and Human Resources (HR) Department personnel are authorized to initiate medical surveillance examinations for TtEC personnel. The CMC should be contacted directly by EHS or HR and provided with the following information: the employee name, social security number, office or project location, phone number, preferred timeframe for the examination, type of examination required (pre-employment, baseline, periodic/annual, project specific or exit) and other special testing required. The CMC will then schedule the examination directly with the employee and the LMP and provide email confirmation of the examination appointment to the employee or the appropriate EHS representative in cases where email is not available.

Pre-employment drug screening and post-occurrence drug testing is carried out in accordance with the procedure PP-14, Substance Abuse Program.

3.4 CMC Procedures

When requested by the Director, ESQ or PESM, the CMC will qualify and recommend additional LMP for new offices or project locations. The CMC will maintain a current listing of all LMPs and will consult with the Director, ESQ when making changes to this listing.

The CMC shall provide detailed guidance to the LMPs regarding testing protocols, logistics, billing procedures, and quality assurance requirements. The CMC is responsible for ensuring that the LMPs follow the detailed guidance.

The CMC will obtain and furnish each TtEC employee and the ESS or office Environmental & Safety Coordinator (ESC), a written Work Status Report which includes the following:

- An opinion as to whether the employee has any detectable medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response, or from respirator use;
- The recommended limitations upon the employee's assigned work;
- The results of the medical examination and tests; and
- A statement that the employee has been informed by the physician of the results of the medical examination and any
 medical conditions which require further examination or treatment.

The CMC will complete a Certification for Hazardous Waste and Respirator Use following each hazardous waste examination and provide a copy to the ESS or ESC.

The CMC shall maintain an accurate record of all medical surveillance examinations performed for TtEC employees. All records shall be cataloged and maintained in secure, access controlled storage for the term of the contract. All employee medical records will be turned over to Director, ESQ or other designated medical facility on request.



4.0 GUIDANCE

4.1 Annual/Periodic Physical Examination Protocol

Employees should be provided an annual/periodic physical examination within 30 days of the anniversary of their previous physical examination if their job assignment still requires an exam per_regulation, contract or ES&H plan specifics. Employees who wear a respirator less than 30 days/year or employees who are only involved in site visits, but not actual site work, may be on a 2-year periodicity for physical examinations as directed by the CMC. The contents of the annual medical examination are the same as the initial exam except as follows:

- Chest X-ray to be performed every five years unless the physician determines that increased periodicity is necessary.
- 12-lead resting EKG. The EKG will be performed according to the following schedule: every three years for those under the age of 40, every two years for those 40 to 50 years of age, and annually for those more than 50 years of age.

4.2 Termination/Reassignment Physical Examination Protocol

Physical examinations are made available to employees who participated in the medical surveillance program when they terminate employment with TtEC or upon reassignment to a job position which does not require participation in the program except as follows:

Hazardous Waste Site Activity Since Last Examination	Termination/Reassignment Examination Decision
No	Examination not offered unless required by project specifications or other OSHA standards
Yes	CMC will determine if examination is indicated unless required by project specification or other OSHA standards. The decision will be based upon the nature of the previous site(s)' contaminants and job site activities, documented exposure levels, and/or the results of the previous medical examination.

The CMC will provide documentation for each employee's medical file for which a termination/reassignment examination was waived. The documentation will include the rationale for waiving the examination.

When termination/reassignment medical examinations are performed, the content shall be the same as for the annual/periodic examination except that the chest X-ray is to be performed unless one has been performed in the last 12 months.

Employees who do not wish to avail themselves of the termination/reassignment examination will be requested to complete and sign the Medical Examination Refusal form included as Attachment A. If the employee does not take the examination and does not sign the refusal form, then TtEC's efforts to make the examination available will be documented in the project and employee's medical file.

Project specifications may require exit examinations when personnel leave the project or when a project ends. If the CMC feels that the exit examination can be waived, then the client should be notified for concurrence and appropriate contract modifications made as necessary.

4.3 Biological Monitoring

Additional medical surveillance parameters and biological monitoring may be performed as appropriate based on the potential for exposures to specific chemicals during site activities. The PESM or ESS and the CMC will determine the need for additional medical surveillance and biological monitoring on a project-specific basis.

4.4 Injury or Illness Examinations

Any employee who is injured, becomes ill, or develops signs or symptoms due to possible overexposure involving hazardous substances or health hazards should be provided consultation and/or examination as directed by the CMC and PESM.

4.5 Return to Work Examinations

Return to work clearance should be obtained from the LMP for all occupational and nonoccupational injuries and illnesses which resulted in or involved:

- Hospitalization
- Five (5) lost workdays days away from work
- Unconsciousness
- Seizures

Return to work clearances may also be required when indicated by the LMP, CMC, PESM, or the Human Resources Department.

4.6 Release of Medical Records

Employees who wish to obtain copies of medical records should notify the Director, ESQ Services, complete the Employee Release of Medical Records (Attachment B), and forward to the Director, ESQ Services.



5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
1. 29 CFR 1910.95, Occupational Noise Exposure	
2. 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response	
3. 29 CFR.1926.1020, Access to Employee Exposure and Medical Records	
4. OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)	
5.	
6.	
7.	



6.0_ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
A. Medical Examination Refusal Form	EHS 4-5 Attachment A. doc
B. Employee Release of Medical Records	EHS 4-5 Attachment B.doc
C.	
D.	

Tetra Tech EC, Inc.

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EHS 4-5 ATTACHMENT A



MEDICAL EXAMINATION REFUSAL FORM

I,	, acknowledge the Tetra Te	ech EC, Inc. (TtEC) has
	me with full opportunity, to take an exit medi	
of my employment at the	Projec	ct Site(s)/TtEC office. I
understand that this exam was	s offered to me at no charge. I also unders	tand that this exam is an
important part of the Health and	Safety Program for workers at hazardous wast	e sites.
I have elected to refuse to take t	this exam. I understand that my refusal to take	the exam at this time may
result in failure to discover po	otentially preventable health problems and re-	ecognize that TtEC is not
obligated to provide any further	examination.	
I have worked at the following s	sites during my employment with TtEC:	
F 1 N (')		
Employee Name (print)	Employee Signature	Date
Witness Name (print)	Witness Signature	Date

EHS 4-5 ATTACHMENT B

TETRA TECH EC, INC. EMPLOYEE RELEASE OF MEDICAL RECORDS

TO: Director, Health and Safety Programs

Please provide copies of	medical records being mai	ntained by Tetra Tech EC, Inc. for:
Employee Name:		
Social Security Number:		
Address:		
Telephone Number:		
Project(s) Worked On:		
Dates of Employment:		
Copies of these records information to the employee'		te: Tetra Tech EC prefers to release this
Employee	Personal Physician	Authorized Representative
Name:		
Address:		
Telephone Number:		
Employee Signature		Date

EHS 4-6: Temperature Extremes

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 01/24/2011

ESQ - Environmental Health & Safety Programs

Purpose: The purpose of this procedure is to prevent heat and cold stress related injuries and illnesses at field operations.

Version Date:

01/28/2011 - Revised

Original Issue Date:

02/01/95

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Company Procedures

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Departmental/Discipline

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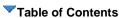
Keyword Index:

EHS Compliance/Waste Management, Monitoring,

Operational Control, Training

Skip Parry

Approved By:



See Below



1.0 PURPOSE

The purpose of this procedure is to prevent heat and cold stress related injuries and illnesses at field operations.

2.0 SCOPE

This procedure applies to all Tetra Tech EC, Inc. ("the Company") and subcontractor field personnel that may be exposed to heat or cold stress during the performance of their field work assignments.

3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Line Management

General responsibilities are found in EHS 1-1, Responsibilities for Program Implementation. Procedure specific responsibilities are:

Site Supervisors have the responsibility to:

- a. Evaluate the work activities and anticipated temperatures that may affect worker productivity or harm workers.
- b. Provide resources and facilities necessary to prevent health effects from temperature extremes.
- c. Enforce work rules related to such prevention.

3.1.2 Environmental, Health and Safety Personnel

The Project Environmental and Safety Manager (PESM) will make the initial determination of heat and cold stress prevention requirements as part of the site EHS Plan (see EHS 3-2, EHS Plans) and oversee the implementation of this program on a project basis for all Company field programs.

The Environmental Safety Supervisor (ESS) will assist with implementation of heat and cold stress prevention programs. The ESS will, in most cases, be the person responsible for monitoring heat and cold stress on the job, determining work/rest and work/warm-up schedules where used, and will implement emergency response or corrective action, if needed. The ESS will train site personnel on the effects of temperature extremes and the site prevention program, and will maintain records related to this program.

The ESS will implement the appropriate heat stress or cold stress requirements when temperatures indicate a potential heat or cold stress condition. The ESS will work with the line management to implement work rest regimens or other administrative controls such as ceasing certain activities, changing PPE, or engineering controls such as warming areas, cooling areas or shifting work schedules.

3.2 General Program Requirements

Adverse temperature conditions must be considered when planning site operations. Heat and cold stress injuries are completely avoidable with the proper education and work monitoring.

Implementing organizations will determine if contractual or regulatory requirements apply. Numerous Federal Agencies (e.g. USCOE, DOE) will contractually impose requirements related to temperature extremes. Also several states have passed regulations with requirements that will be applicable when working in those areas. In these cases, the information in the Guidance section and the attachments may become requirements.

4.0 GUIDANCE

This section contains optional guidance information to successfully execute the procedure.

4.1 Definitions

4.1.1 Body Core Temperature

The temperature of the organs within the trunk of the body.

4.1.2 Deep Frostbite

The tissue beneath the skin is solid to the touch; it may involve a full thickness freeze to the bone. This is an extreme emergency and can result in permanent tissue loss.

4.1.3 Frostbite

Freezing of body tissue.

4.1.4 Frostnip or Incipient Frostbite

A cold related injury that progresses slowly and is painless while developing. The victim is usually unaware that he/she has frost nip. The skin first becomes reddened, then changes to white; no freezing of tissue occurs.

4.1.5 Heat Cramp

Painful muscle spasms usually occurring on the arms, legs, and abdomen; caused by excessive loss of body electrolytes from profuse sweating.

4.1.6 Heat Exhaustion/Fatigue

Heat Exhaustion is a form of shock that occurs when the body loses large amounts of water and electrolytes from excessive perspiration after exposure to heat and physical activity; also called heat prostration. Symptoms include profuse sweating, pale, cool, sweaty skin and other symptoms identified in Attachment 1, Section 1.3. Heat fatigue refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Works unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance.

4.1.7 Heat Rash

Profuse tiny raised red vesicles (blister-like) on affected areas of the skin which cause a prickling sensation during heat exposure.

4.1.8 Heat Stroke

A life-threatening condition caused by rapidly rising body core temperature that occurs when the body's temperature regulating mechanisms are overwhelmed. Sweating stops and the skin is dry and hot.

4.1.9 Hyperthermia

A rise in body core temperature above 99.6° F.

4.1.10 Hypothermia

Decreased body core temperature from prolonged exposure to freezing or near-freezing temperatures. This is the most life-threatening cold injury and affects the entire body with possible localized severe cooling. Hypothermia is defined as the deep body temperature dropping below 96.8°F (36°C).

4.1.11 Superficial Frostbite

Frostbite which affects the skin and tissue just beneath the skin. The skin is firm and waxy, tissue beneath is soft and numb. The skin turns purple and may tingle and burn during warming.

4.1.12 Wet-Bulb Globe Temperature (WBGT) Index

Method used to measure the environmental factors (e.g., temperature, relative humidity) which impact the body's physiological responses to heat.

4.1.13 Wind-Chill Factor or Equivalent Chill Temperature (ECT)

An index describing the effect of the cooling power of moving air on exposed flesh. The effect of wind velocity at a certain temperature is expressed as the equivalent cooling effect of a lower temperature with still air.

4.1.14 Work/Recovery Regimen

The ratio of time spent working to time spent resting in an area designed to relieve heat related conditions. This ratio is expressed in one hour periods. Example: A work/recovery regimen of 75% work, 25% rest corresponds to 45 minutes work, 15 minutes rest each hour.

4.2 General Program Guidance

Excessively hot or cold working environments can produce a number of different injuries. Critical to the ability to care for those injuries is a basic understanding of the way in which the body maintains its temperature and how it physiologically adjusts to extremes of heat and cold.

Preventing Heat and Cold Stress is prevented by planning in advance, and by training affected personnel in the symptoms of temperature extremes. OSHA has not established a temperature extremes standard, instead relying on the general duty clause.

The US Army Corps of Engineers has established requirements for work under its control in "EM-385-1-1, most current edition and ACGIH TLV/BEI Guide, most current edition."

The ACGIH Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices has updated its recommendations <u>"in the ACGIH TLV/BEI Guide, most current edition</u>." These recommendations are incorporated in the appropriate sections.

Several states have also passed regulations or temperature extremes (e.g. Washington, California).

Three attachments are attached to provide information related to temperature extremes:

- Attachment 1 provides information on the body's physiological responses to heat and cold stress.
- Attachment 2 provides information on Heat Stress Monitoring and Work/Rest Regimens.
- Attachment 3 provides information on Cold Stress Monitoring and Work Recovery Regimens.

Proper care of victims who are suffering from the effects of heat or cold exposure will help to minimize injuries and speed recovery. On the other hand, improper treatment of these emergencies can result in serious injury, disability, or death.

The most effective first aid for any injury is prevention. When acceptable monitoring and prevention programs are followed, there should be no victims.

4.3 Heat Stress

A heat stress prevention program will be implemented when ambient temperatures exceed 70°F (21° C) for personnel wearing **permeable** clothing. Wet Bulb Globe Temperature Index (WBGT) or physiological monitoring will be conducted. When a WBGT Index is not available, or workers are wearing impermeable clothing, or the WBGT is not representative to the actual work area (enclosed work areas, work over asphalt or reflective materials etc.) **physiological** (pulse, temperature) **monitoring** may be used in its place.

WBGT devices located away from the project (up to several miles) maybe used for monitoring the project if the general weather and measured work surfaces are similar.

4.3.1 Selection of Chemical Protective Clothing

The PESM will review site data and working conditions and select the personal protective equipment ensemble

that best protects the employees from site hazards. The risk of heat related illness will be fully considered in balancing the risks and benefits of the PPE.

4.3.2 Hydration

The Company will supply cool potable water or other suitable drinks (e.g., sport electrolyte replacements) for fluid replacement. Employees involved in the heat stress prevention program will be trained and encouraged to drink at a rate of approximately 8 oz. every 20 minutes. Individual disposable cups will be used and kept in closed containers or dispensers. Alternately, cool bottled water or sports drinks in individual sealed bottles may be provided.

4.3.3 Cool Rest Areas

Shaded rest areas will be provided. On large remediation projects, air conditioned rest areas should be provided for workers exposed to heat stress conditions. In low humidity locations, evaporative coolers or misting devices and fans can be used to provide cool down locations. On smaller projects, personnel can use air-conditioned vehicles as cool down areas.

4.3.4 Other Prevention Elements

The PESM, ESS and the Project Manager will incorporate other elements into the heat stress prevention program as necessary. The selected elements will be described in the EHS plans. Engineering controls are preferred. Where their use is not feasible, the program must incorporate administrative/work practice controls, personal protective equipment, or a combination. Examples of prevention program elements include:

- a. Engineering Controls
 - Air conditioned cabs for heavy equipment and vehicles (such controls may eliminate the need for other program elements).
 - Fans, blowers, or misters
 - Cool water for drenching personnel in impermeable clothing. This can be provided through a
 garden hose, a garden sprayer filled with ice water, a clean drum full of water for "hard hat
 dipping" for containers of ice water and clean towels in the rest area to hasten cool down.
- b. Administrative and Work Practice Controls
 - Adjusting work schedules to do the bulk of the work during the cooler parts of the day.
 - Acclimating workers.
 - Implementing work/rest regimens (See Attachment 2 for Work/Rest Regimen Procedures)
- c. Personal Protective Equipment
 - Ice Vests
 - Circulating water vests
 - Vortex tubes and air circulating vests

Where ice vests and circulating water vests are used, rest periods of approximately 15 minutes should be taken when ice packs or batteries need to be changed. Continuous work over long periods of time with these devices may present an increased musculoskeletal injury risk due to the extra weight. Since the duration of the cooling effectiveness of these devices will vary with heat and work loads, users must be instructed to leave the area to replenish ice or batteries at the first sign of loss of cooling.

d. Monitoring

A program of environmental and physiological monitoring must be established in order to use work/rest regimens to verify the effectiveness of the regimens. The monitoring procedures are described in Attachment 2.

4.3.5 Training

All site personnel must receive training on the following topics:

- a. Health effects of hot environments and symptoms of heat related illness.
- b. Personal risk factors; including use of some medications (e.g. blood pressure, allergy, renal or sweat gland functions), physical condition, insufficient sleep; attempting full work loads when not fully acclimatized and dehydration due to consumption of alcohol, consumption of caffeine or other diuretics.
- c. Effect of personal protective equipment on heat stress conditions.
- d. Preventive measures
 - Physiological monitoring methods and thresholds
 - Acclimatization
- e. Fluid replacement; including taking frequent breaks for fluid replacement on an as-needed basis, maintaining hydration and electrolyte balances.
- f. Elements of the site Heat Stress Prevention Program.
- g. First aid and emergency response

Records shall be maintained in accordance with EHS 1-9, Recordkeeping.

4.4 Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trenchfoot or immersion foot, and hypothermia as well as slippery surfaces, brittle equipment, poor judgment and taking short cuts. ACGIH guidelines are provided in Attachment 3.

The Company will implement the following cold stress prevention program elements when there is a potential for cold related injuries. Workers should be protected from exposure to cold so the core body temperature does not fall below the Threshold Limit Value of 96.8°F (36°C).

4.4.1 Personnel Protective Equipment

The following personal protective equipment will be provided as necessary to Company employees when conditions indicate a potential for cold-related injury. Subcontractors will be expected to supply appropriate equipment to their employees.

- a. Hard hat liners, face covers
- b. Gloves or glove liners, chemical sock and glove warmers
- c. Rain gear or water impermeable coveralls and gloves for potentially wet operations
- d. Fleeced boot liners where rubber steel-toe boots are used
- e. Winter coveralls

4.4.2 Engineering Controls

A variety of engineering controls shall be evaluated to minimize cold stress. These include:

- a. General or spot heating should be used to increase temperature at the workplace.
- b. If fine work is to be performed with bare hands in a cold environment, special provisions should be made to keep the workers' hands warm. Warm air jets, radiant heaters, or contact warm plates can be used.
- c. The work area should be shielded from winds and drafts that may affect the wind chill factor.
- d. The air velocity in refrigerated rooms should be minimized as much as possible, and should not exceed 2.2 mile/hour (1m/sec) in the work zone.
- e. At temperatures below freezing, metal handles of tools and control bars should be covered with thermal insulating material.
- f. Unprotected metal chair sets should not be used as they conduct heat away from the body.
- g. When necessary, equipment and processes should be substituted, isolated, relocated, or redesigned to reduce cold stress at the worksite.
- h. Power tools, hoists, cranes, or lifting aids should be used to reduce metabolic workload.
- i. Heated warming shelters such as tents and cabins should be made available if work is performed continuously in an equivalent chill temperature of 20°F or below.
- j. The ESS may implement a work-rest schedule to reduce exposure to cold stress.
- k. Scheduled rest breaks should be enforced.
- I. Personnel exposed to the cold should be provided the opportunity for frequent intake of warm, sweet, caffeine-free, nonalcoholic liquids or soup.
- m. Work should be moved to warmer areas whenever possible.
- n. Extra workers should be assigned to highly demanding tasks.
- o. Workers should be allowed to pace themselves, taking breaks when needed.
- p. Workers shall be trained in the prevention, symptoms, and emergency response to cold stress.
- q. Utilize the "buddy system" to monitor cold stress symptoms among the workers.
- r. Allow new employees time to adjust or "acclimate" to cold conditions.
- s. Minimize the need to sit or stand in one place for long periods of time.

- t. Minimize the amount of work time spent in a cold environment.
- u. Allow for the weight and bulkiness of protective clothing when estimating work performance goals and tasks.

4.4.3 Warm Rest Areas

The Company will make warm rest areas, e.g., heated trailers, available for rest breaks in cold weather. Employees will be permitted and encouraged to use the heated trailers whenever they experience symptoms of cold stress.

4.4.4 Work/Warm-Up Schedules

The work/warm-up schedule found in the ACGIH for cold stress will be followed as a guideline unless a government project, where they are required by ACOE or DOE regulation (Attachment 3). In addition, the Company will make warm-up periods available to employees who need to change into dry clothing to prevent immersion foot or hypothermia.

4.4.5 Training

All Company employees and subcontractors will be trained in:

- a. The effects of cold stress, including frostbite, immersion foot and hypothermia.
- b. Conditions that can lead to hypothermia, including work practices, clothing, activity levels, wind chill.
- c. Personal risk factors, including use of some medications, physical condition, insufficient sleep, dehydration due to consumption of caffeine, alcohol or other diuretics.
- d. Recognition of the symptoms.
- e. Methods employees can use to protect themselves.
- f. First aid procedures and recognition of medical emergencies.

Records shall be maintained in accordance with EHS 1-9, Recordkeeping.

5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link in this Column
ACGIH (American Conference of Government Industrial Hygienists) Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2007	
2. Fundamentals of Industrial Hygiene. Third Edition, 1988	
3. National Safety Council	
4. NIOSH (National Institute for Occupational Safety and Health)	
5. NIOSH/OSHA/EPA/USCG/EPA	
6. Occupational Exposure to Hot Environments, Revised Criteria 1986	
7. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities - October 1985	
8. EHS 1-1, Responsibilities for Program Implementation	۵
8. EHS 1-9, Recordkeeping	a
9. EHS 3-2, Environmental, Health & Safety Plan(s)	C)
10. US Army Corps of Engineers, Safety & Health Manual (EM	

385-1-1) Nov 2003, Section 06.J.04



6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here
Heat and Cold Stress Information	W h
	EHS 4-6, Attachment 1 final 11-8-08.doc
2. Heat Stress Monitoring and Work/Rest Regimens	
	EHS 4-6, Attachment 2 Final 11-11-08.doc
3. Cold Stress Monitoring and Work/Recovery Regimens	
	EHS 4-6, Attachment 3 final 11-8-08.doc
4. Example - WBGT Monitoring Form	
	Attachment 4 Example WBGT Monitoring Form 11-11-08.doc
5.	

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ATTACHMENT 1

HEAT AND COLD STRESS INFORMATION

1.0 HEAT STRESS

Hot weather can cause physical discomfort, loss of efficiency, and personal injury. The human body strives to maintain a constant core temperature of 98.6° F (37° C). If this temperature is to be maintained, heat loss must equal heat production. This balance is maintained by variations in the blood flow to the outer part of the body. When the core temperature rises, blood vessels beneath the skin dilate, and the blood brings increased heat to the skin, where it is dissipated by radiation and convection. This works only as long as the skin temperature is <u>higher</u> than the temperature of the outside environment. Heat loss by radiation convection is impossible when the temperature of the outside air approaches or exceeds the temperature of the skin. The body will now rely on dissipation through evaporation of sweat. But the sweat mechanism also has limits. The normal adult can sweat only about one liter per hour and can sweat at that rate for only a few hours at a time. In addition, sweating is effective only if the relative air humidity is low. Sweat evaporation ceases entirely when the relative humidity reaches 75 percent.

Of particular concern in heat stress monitoring is the use of personal protective clothing which decreases natural body ventilation and greatly increases the temperature and humidity to the skin. If precautions are not taken, heat stress will progress into a heat-related injury. Heat-related injuries fall into three major categories: heat cramps/fatigue, heat exhaustion, and heat stroke.

1.1 Heat Cramps

Heat cramps are the least common and least severe of heat injuries. Heat cramps are thought to occur when the electrolytic balance in the blood between water, calcium, and sodium (salt) is altered. Low blood salt level, from profuse sweating and inadequate salt consumption, is the usual cause, as well as poor conditioning..

1.1.1 Symptoms

- a. Severe muscle cramps and pain, especially of the upper legs, calves, and abdomen, and occasionally in the arms
- b. Faintness and dizziness
- c. Possible nausea and vomiting

1.1.2 Treatment

Emergency care will include:

- a. Remove victim from the hot environment and allow victim to rest and cool down
- b. Provide small amounts of cool water or use a commercial sport drink and allow victim to sip this solution to hydrate. Avoid drinks with caffeine or alcohol.

c. To relieve pain, gently stretch the involved muscle group; gently message cramps as long as it does not increase the pain or discomfort.

The victim should avoid exertion of any kind for 12 hours. A victim of heat cramps is prone to recurrence.

1.2 Heat Fatique

Heat Fatigue is most likely to affect new or un-acclimatized workers.

1.2.1 Symptoms

- a. Loss of energy, extreme tiredness
- b. Stumbling, staggering, or loss of balance. The loss of balance is a particular risk to workers on elevated surfaces or climbing.
- c. Excessive skin redness as body moves blood to surface
- d. Lack of judgment recognizing the onset of heat fatigue and taking action to remove themselves from the environment for cool down and hydration

1.2.2 Treatment

- a. Remove from the hot work environment for cool down
- b. Provide fluids (cool water or sport drinks to re-hydrate the victim
- c. Extend cool-down period or cessation of work for the day with extra hydration and rest
- d. Enhance observations by other workers and physiological monitoring
- e. Provide individual work/rest regimens until acclimatized

1.3 Heat Exhaustion

1.3.1 Symptoms

Heat exhaustion is the most common heat injury and usually occurs in an individual who is involved with heavy physical exertion in a hot, humid environment, and is wearing protective clothing. Heat exhaustion is a mild state of physical shock caused by the pooling of blood in the vessels just below the skin, causing blood to flow away from the major organs of the body. Due to prolonged and profuse sweating, the body also loses large amounts of salt and water.

The symptoms of heat exhaustion include:

- a. Profuse sweating
- b. Pale, cool, sweaty skin
- c. Headache and extreme weakness, fatigue
- d. Nausea and possible vomiting

- e. Dizziness and faintness
- f. Collapse and possible brief unconsciousness
- g. Body core temperature from 100.4° F (38° C) to 104° F (40° C), although skin temperature may even be slightly below normal.

1.3.2 Treatment

Emergency care will include:

- a. Remove victim from the hot environment and out of the exclusion zone
- b. Lie victim down with feet slightly raised
- Remove as much clothing as reasonable (especially personal protective clothing); loosen what cannot be removed
- d. Apply cold, wet compresses to the skin; fanning will also aid in cooling
- e. If the victim is fully alert, allow him/her to drink water at the same rate, that was used for the emergency care of heat cramps
- f. If the victim vomits, do not give fluids by mouth, transport him/her to a hospital immediately (dehydration is the most critical problem in heat exhaustion victim; intravenous fluids will have to be given)
- g. Take temperature every 10 minutes, if the victim's temperature is above 101°F (38.3 C) or shows a steady increase, transport to a hospital immediately and start sponging him/her off with cool water

1.4 Heat Stroke

Heat stroke is a true life-threatening emergency having a mortality rate of 20 to 70 percent. This condition results when the heat regulating mechanisms of the body break down and fail to cool the body sufficiently. The body temperature rises to between 104° F and 110° F ($40.6-43.3^{\circ}$ C); no sweating occurs in about 50 percent of the victims. Because no cooling takes place, the body stores increasingly more heat, and eventually brain cells are damaged, causing permanent disability or death.

There are two basic kinds of heat stroke: classic heat stroke and exertional heat stroke. Classic heat stroke, in which people lose the ability to sweat, generally effects the elderly or chronically ill. Exertional heat stroke, in which victims retain the ability to sweat, is accompanied by physical exertion and muscle stress. Exertional heat stroke is the type that will be most commonly encountered on a field operation requiring strenuous physical activity.

1.4.1 Symptoms

- a. Oral temperature of 104° F (40° C) or higher
- b. Hot, reddish skin, skin is usually dry
- c. Headache

- d. Dry mouth
- e. Shortness of breath
- f. Nausea or vomiting
- g. Increasing dizziness and weakness
- h. Mental confusion and anxiety; victims may show unusual irritability, aggression, combative agitation, or hysterical behavior
- i. Convulsions, sudden collapse and possible unconsciousness; all heat stroke victims having varying levels of consciousness, ranging from disorientation to coma

1.4.2 Treatment

Emergency care will include:

- a. Remove the victim from the hot environment and from the exclusion zone
- b. Call for trained emergency medical personnel **immediately**
- c. Remove as much clothing as reasonable (especially personal protective clothing); cut clothing with bandage scissors, if necessary, being careful not to injure victim
- d. Pour cool water over the victim, avoiding his nose and mouth
- e. Fan the victim
- f. Place cold packs under the arms and against neck, groin and ankles
- g. Wrap victim in a wet blanket
- h. Continue a combination of these methods until the oral temperature falls below 103° F (39.4° C) (take measures to prevent chilling, if necessary, i.e., use slower cooling if the victim starts shivering
- i. Elevate the head and shoulders slightly during cooling
- j. Never give the victim anything to drink unless fully conscious and vomiting is unlikely

Because heat stroke involves the entire body, a number of complications may result including brain swelling, convulsions, coma, kidney failure, liver failure, high blood pressure and heart failure.

Therefore, always transport the victim to a hospital even if the body core temperature has lowered to near normal.

1.5 Heat Stroke Verses Heat Exhaustion

The two most reliable and distinct differences between heat stroke and heat exhaustion are:

1.5.1 Heat Stroke

- a. Skin flushed (red); may be dry; hot to touch (note: Personnel who have been wearing impermeable clothing may have wet skin from earlier sweating that has ceased.)
- b. Oral temperature above 104°F (40° C)

1.5.2 Heat Exhaustion

- a. Skin pale; wet or clammy; cool to touch
- b. Oral temperature usually normal

2.0 COLD STRESS

Hypothermia is a drop in the core body temperature below 96.8° F (36° C). The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold at about 95° F (35° C); this is followed by a slowed and sometimes irregular heart beat, a weakened pulse and a drop in blood pressure. Vague or slow slurred speech, memory lapses, apathy, incoherence and drowsiness can occur. Other symptoms may include cool skin, slow, irregular breathing, apparent exhaustion, and fatigue after rest.

2.1 Prevention

Hypothermia is caused by prolonged exposure to a cold environment, whether air, water, or snow and ice. Adequate dry clothing with appropriate insulating capacity must be provided to workers to prevent hypothermia, especially if work is performed in air temperatures below 40° F (4.4° C). Wind chill is a critical factor. Work at a slow but steady pace. The job should be a "no sweat" operation.

Unless there are unusual or extenuating circumstances, cold injury to other than the extremities (hands, feet, and head) is not likely to occur without the development of the initial signs of hypothermia. Older workers or workers with circulatory problems require special precautionary protection against hypothermia. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are special precautions that should be considered for these workers. The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.

2.2 Treatment

First aid for mild hypothermia will be performed as follows:

- a. End the exposure get the victim out of the cold and wet
- b. Replace wet clothing with dry or add insulation to clothing
- c. Offer warm, non-alcoholic fluids
- d. Increase exercise
- e. Seek shelter from wind, wet and cold

<u>CAUTION</u>: If the victim remains cold for a number of hours, chemical changes may have taken place which, on re-warming, may cause major medical problems for the victim and which could result in death. <u>Severely hypothermic victims are best warmed in the hospital under controlled conditions</u>. If a severely hypothermic victim cannot be transported to a hospital within a few hours, re-warming should begin in the field.

2.3 Frostbite

2.3.1 Prevention

Frostbite can be prevented by wearing sufficient protection to prevent skin from coming into prolonged contact with a freezing environment. The following steps can be taken.

- a. Wear sufficient clothing. Mittens are better than gloves. Face masks and wool stocking caps are better than hats. Wind and waterproof hoods protect the face and neck.
- b. Clothing should be loose enough to prevent constriction of blood vessels. Boots must be roomy enough to permit movement of the toes with no feeling of tightness.
- c. Do not contact conductive metals or contact gasoline or other solvents with bare skin as rapid evaporation of solvents may quickly lead to frozen tissues in a cold environment.
- d. Exercise the toes and fingers to maintain circulation.
- e. Observe the condition of your partners' face, hands and ears frequently for signs of frostbite.
- f. Avoid smoking and drinking alcoholic beverages.

2.3.2 Symptoms

Frostbite can occur either before or after the onset of hypothermia when body tissue (usually an extremity) is exposed to freezing temperatures. Frostbite occurs when the fluids surrounding tissue cells freezes. The danger of frostbite increases with increased wind chill and/or reduced temperatures below 32° F (0° C). Frostbite can also occur if tissues are in prolonged contact with a frozen material or object. Skin contact with frozen metal, for example, can result in frostbite in a short period of time, even in a warm environment.

There are three degrees of frostbite:

- a. First degree freezing without blistering or peeling, "frostnip"
- b. Second degree freezing with blistering and/or peeling, and
- Third degree freezing resulting in the death of skin tissue and possibly the death of underlying tissues as well

Symptoms of frostbite include the following:

- a. The skin changes color to white or grayish-yellow, progresses to reddish-violet, and finally turns black as the tissue dies
- b. Pain may be felt at first, but subsides

- c. Blisters may appear, and
- d. The affected area is cold and numb

2.3.3 Treatment

First aid for superficial (first degree) frostbite is as follows:

- a. Place a warm body part next to the frozen area, applying firm, steady pressure.
- b. DO NOT RUB THE AREA. Rubbing may cause further damage to already injured skin.
- c. Protect the area from further freezing.

First aid for deep frostbite (second and third degree) is as follows:

- a. KEEP THE FROZEN PART FROZEN!
- b. Prevent further injury: avoid rubbing and further freezing of unaffected tissue.
- c. If the part has thawed, the part should NOT be allowed to refreeze or bear weight. A victim with thawed feet should be carried out.
- d. Give the victim plenty of fluids and evacuate to medical assistance as soon as possible.

2.4 Trench Foot

2.4.1 Symptoms

This condition may be caused by long, continuous exposure to cold without freezing, combined with persistent dampness or actual immersion in water. Edema (swelling), tingling, itching, and severe pain occur, and may be followed by blistering, death of skin tissue, and ulceration. When other areas of the body are affected besides the feet, the condition is known as chilblains.

2.4.2 Prevention

Trench foot and chilblains can be prevented by keeping the body as dry as possible at all times. Waterproof boots should be worn when required, but provisions must be made for preventing excessive perspiration to accumulate inside the boots. Socks should be changed at least twice daily and the boots wiped dry inside with each change of socks. The feet should also be wiped dry and foot powder applied.

2.4.3 Treatment

Affected body parts should not be rubbed or massaged, but bathed in water using plain white soap. Dry thoroughly and elevate the body part, allowing the body part to be exposed at room temperatures. If the feet are affected, do not walk during treatment.

(Internal Note – this attachment is a total revision and no revision bars are shown) ATTACHMENT 2

HEAT STRESS MONITORING AND WORK/REST REGIMENS

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1.0 INTRODUCTION

Establishing a work/rest regimen that allows work to be completed in a timely manner while providing adequate rest time to prevent heat stress requires involvement of the ESS, Project Supervisors, and individuals involved. In many cases, particularly when wearing normal field type clothing (i.e., level D), awareness and communication are the key elements to a successful program. Allowing and encouraging rest periods on an "as needed" basis while ensuring vigilance for initial symptoms of heat stress, encourages this success.

There are times when this approach is not appropriate. When heat stress contributing protective clothing (e.g., respirators, impermeable coveralls) are worn for extended periods, or when "as needed" work/rest regimens adversely impact either the individuals exposed to the heat source or work completion, a more formal work/rest regimen will be established.

Formal work/rest regimens are based on when Action Levels and TLV limits are approached and: 1) monitoring ambient conditions (e.g., with a Wet Bulb Globe Temperature Index (WBGT), estimating work loads and establishing work/rest times, 2) monitoring physiological conditions and adjusting work/rest periods, 3) applying Job Specific Controls.

The WBGT, physiological monitors, and personnel heat stress monitors will be used in accordance with manufacturer's instructions. Personnel heat stress monitors will be approved for use by the PESM.

This attachment includes guidance for monitoring and preventing heat stress and heat strain in accordance with the 2007 ACGIH. The 2007 ACGIH Guidelines were revised to include an Action Level and a Threshold Limit Value based on WBGT measurements). The goal is to maintain body core temperatures within +/- 1.8° F of 98.6° F (+/-1° C. of 37° C) The TLV represents conditions under which it is believed that nearly all acclimatized, adequately hydrated, unmedicated, healthy workers may be repeatedly exposed without adverse health effects. The Action Limit is similarly protective of unacclimatized workers and represents conditions for which a heat stress management program should be considered.

This guidance is not a fine line between safe and dangerous. Therefore professional judgment is of particular importance in assessing the level of heat stress and physiological heat strain to provide for protecting nearly all healthy workers with due consideration of individual types and type of work.

The decision process shown in Figure 1-1 should be started if 1) a qualitative exposure assessment indicates the possibility of heat stress, 2) there are reports of discomfort due to heat stress, or 3) professional judgment indicates heat stress conditions.

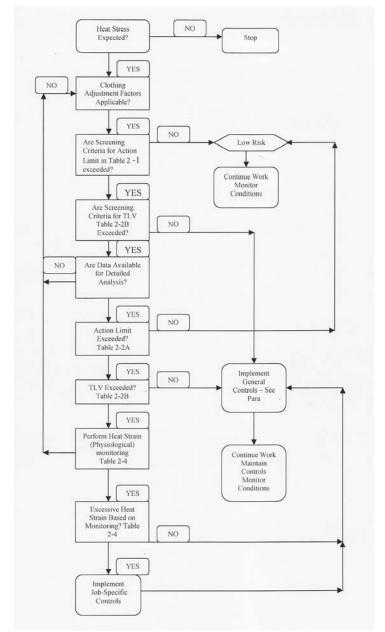


Figure 1-1 – Evaluating Heat Stress and Strain

Note: At the option and judgement of the ESS, physiological monitoring may be commenced at any time, supplementing or replacing WBGT monitoring.

2.0 WBGT-BASED WORK/RECOVERY REGIMENS

2.1 Work/Recovery Regimens

When required, the WBGT Index will be used in conjunction with the work load, protective clothing, and other factors to determine the appropriate work/recovery regimen and need for physiological monitoring for personnel.

The ESS will monitor the temperature, work loads, and protective clothing. The WBGT will be adjusted based on the clothing adjustment factors. The Work Loads and the WBGT will then be used to determine the Work and recovery cycles for the workers involved.

The work/recovery regimen using the WBGT procedure will be used as a guideline, as the WBGT is only an index of the environment. Table 2-1 identifies the Clothing Adjustment factors.

Table 2-1 Clothing-Adjustment Factors for Some Clothing Ensembles

Clothing Type	Addition to WBGT Index
Work Clothes (Long Sleeve Shirt and Pants)	0° F (0° C)
Cotton (woven material) Coveralls	0° F (0° C)
Double Layer woven Clothing	5.4° F (3° C)
SMS Polypropylene Coveralls	1.0° F (.5° C)
Polyolefin Coveralls	1.8° F (1° C)
Limited-Use Vapor Barrier coveralls	19.8° F (11° C)

Notes on Table 2-1:

For example, WBGT Index is 86 $^{\circ}$ F. If double layer woven overalls (5.4 $^{\circ}$ F) are used with acclimatized workers the Corrected Index Temperature is 91.9 $^{\circ}$ F.

These values must not be used for completely encapsulating suits, often called Level A. Clothing Adjustment factors cannot be added for multiple layers. **The coveralls assume that only modesty clothing is worn underneath, not a second layer of clothing.**

These values may also apply to other protective clothing, such as rain suits, when worn where the body is fully covered and the worker does not have the option of opening or venting the clothing while working (e.g., individuals in a radiological zone or other hazardous areas.

Tables 2-2-A and 2-2-B outline the work/recovery regimens based upon WBGT temperature and workload.

Table 2-2A Permissible Heat Exposure Action Limit Values (Values are given in °F and (°C) WGBT Index)*

Allocation of Work in a	Work Load Category							
Cycle of Work and	Light	Moderate	Heavy	Very Heavy				
Recovery								
75% to 100%	82.4 (28.0)	77.0 (25.0)						
50% to 75%	83.3 (28.5)	78.8 (26.0)	75.2 (24.0)					
25% to 50%	85.1 (29.5)	80.6 (27.0)	77.9 (25.5)	76.1 (24.5)				
0% to 25%	86.0 (30.0)	84.2 (29.0)	82.4 (28)	80.6 (27)				

Table 2-2B Permissible Heat Exposure Threshold Limit Values)

(Values are given in °F and (°C) WBGT)*

Allocation of Work in a	Work Load Category							
Cycle of Work and Recovery	Light	Moderate	Heavy	Very Heavy				
75% to 100%	87.8 (31.0)	82.4 (28.0)						
50% to 75%	87.8 (31.0)	84.2 (29.0)	81.5 (27.5)					
25% to 50%	89.6 (32.0)	86.0 (30.0)	84.2 (29.0)	82.4 (28.0)				
0% to 25%	90.5 (32.5)	88.7 (31.5)	86.9 (30.5)	86.0 (30.0)				

Notes on Table 2-2-A & 2-2-B:

- a. The values in Table 2-2A & 2-2B are for fully acclimatized workers wearing light weight pants and long sleeved shirts. For conditions other than this, use this table with the Clothing Adjustment factors from Table 2-1. For unacclimatized workers, the Action Limit Values should be used as TLVs.
- b. These values assume that workers drink frequently and have properly increased salting of food prior to exposure.
- c. These values are guidelines. Actual levels may be modified based on individual physiological response and actual work and rest conditions.
- d. These values assume that the rest location is cool enough to alleviate heat load conditions.
- e. See Table 2-2C for Work Load Categories.
- f. Values in the table are applied by reference to the "Work-Rest Regimen" section and assume 8-hour workdays in a 5-day workweek with conventional break.
- g. Because of the physiological strain associated with Heavy and Very Heavy work among less fit workers, regardless of the WBGT Index, criteria values are not provided for continuous work and for up to 25% rest in an hour for Very Heavy work. The screening criteria are not recommended, and a detailed analysis and/or physiological monitoring should be used.
- h. WBGT Index values are expressed to the nearest .5°C and .1°F

Table 2-2C provides examples of work activity categories for use in table 2-2A and 2-2B. Recovery rest areas should be near the work areas, shaded, and with adequate supplies of cool water. Aids to assist in evaporative cooling such as fans or blowers should be considered.

Table 2-2C Work Load Categories

Categories	Example Activities
Resting	Sitting quietly
Light	Sitting with light manual work with and or hands and arms, and driving. Standing with some light arm work and occasional walking.

Moderate	Sustained moderate hand and arm work, moderate arm and leg work, moderate arm and trunk work, or light pushing and pulling. Normal walking.
Heavy	Intense arm and trunk work, carrying, shoveling, manual sawing, pushing and pulling heavy loads; walking at a fast rate.
Very Heavy	Very intense activity at fast to maximum pace,

2.2 Acclimatization

Acclimatization is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. Full heat acclimatization requires physical activity under heat-stress conditions similar to those anticipated for the work. With a recent history of heat-stress exposures of at least 2 continuous hours (e.g. 5 of the last 7 days to 10 of 14 days) a worker can be considered acclimatized for the purposes of the TLV shown in table 2-2B.. Its loss begins when the activity under those heat-stress conditions is discontinued, and a noticeable loss occurs after 4 days and may be completely lost in 3 to 4 weeks. Because acclimatization is to the level of the heat stress exposure, a person will not fully acclimatize to a sudden higher level, such as during a heat wave.

Numerous factors can affect acclimatization and a worker's ability to work in heat, including age and off-work activities (amount of sleep, consumption of alcoholic beverages, prescription and nonprescription mediations (e.g. antihistamines and other medications that decrease the body's ability to carry water or reduce sweating).

2.3 WBGT Determination

WBGT device should be operated in accordance with the manufacturer's instructions. The location of the WBGT device should be evaluated based on the work. Work inside buildings (no wind), within depressions or excavations, over asphalt or black liners (such as HPDE) would dictate that the device should be located near the area to account for the difference in the globe temperature due to radiance and reflection. Work on open soil/gravel will have a lesser affect on the readings and will allow the readings to be indicative of a large area (up to several miles). (Note WBGT Index readings for the area can frequently be obtained on a real-time basis from weather stations, or from the internet).

3.0 HEAT STRAIN GENERAL WORK CONTROLS

General controls for Heat Strain prevention and control include:

- Provide accurate verbal and written instructions, annual training programs and other information about heat stress and strain.
- Encourage drinking small volumes (approximately 1 cup) of cool, palatable water (or other acceptable fluid replacement drink, (e.g. sport drink) about every 20 minutes.
- Permit self-limitation of exposures and encourage co-worker observation to detect signs and symptoms of heat strain in others.
- Counsel and monitor those who take medications that may compromise normal cardiovascular, blood pressure, body temperature regulation, renal or sweat gland functions and those who abuse or are recovering from the abuse of alcohol or other intoxicants.
- Encourage healthy life-styles, idea body weight and electrolyte balance

- Adjust expectations of those returning to work after absence from hot exposure situations and encourage consumption of salty foods (with approval of physician if on a saltrestricted diet).
- Consider preplacement medical screening to identify those susceptible to systemic heat injury.
- Monitor the heat stress conditions and reports of heat related disorders.

4.0 JOB SPECIFIC CONTROLS FOR HEAT STRAIN STRESS

When excessive heat strain is observed or predicted based on monitoring, the some or all of the following Job Specific Controls should be considered:

- Engineering controls that reduce the metabolic rate, provide general air movement, reduce process heat and water vapor release, and shield radiant heat sources, among others.
- Administrative controls that set acceptable exposure times, allow sufficient recovery, and limit physiological strain.
- Personal protection that is demonstrated effective for the specific work practices and conditions at the location.

5.0 PHYSIOLOGICAL MONITORING

5.1 Monitoring Frequencies

Physiological monitoring will commence at the discretion of the ESS, or when WBGT Index monitoring is not used and the ambient temperatures exceed 70° F (21° C). Physiological monitoring may be used whenever work/recovery regimens are implemented to verify the effectiveness of the work/rest ratio including the cool down periods. Physiological monitoring should be used whenever workers have the potential to exceed the TWA or TLV, and must be used when personnel are working in impermeable clothing

Work in impermeable protective clothing should include consideration of a buddy rule (no lone workers), particularly at higher temperatures. The observers should be watching for sudden or severe fatigue, lightheadedness, loss of balance, loss of judgment or clumsiness that may indicate heat fatigue or heat stress.

The monitoring frequencies may be adjusted for individuals after experience with their work in heat stress environments has been gained provided the work involved, PPE, and other factors remain the same.

Attachment 4 is an Example forms that may be used for WBGT monitoring and individual physiological monitoring

5.2 Pulse Rate Monitoring

The level of stress may also be monitored by an individual's pulse rate. If either of the following occur, the individual should be removed from heat stress exposure:

- A sustained (several minutes) heart rate is in excess of 180 beats per minute (bpm) minus the individual's age in years (180-age), for individuals with normal cardiac performance. or
- A recovery heart rate greater than 120 bpm one minute after a peak work effort

The affected individual should be removed from the heat stress exposure and allowed to recover.

A recovery heart rate less than 110 bpm at indicates the individual can return to work but the work period should be adjusted. Shorten the next work period by one third while maintaining the same rest period. Increase the monitoring on the individual.

Pulse rates can be taken with an electronic pulse meter, or manually with a stopwatch for 30 seconds.

5.3 Body Core Temperature

Obtaining an accurate body core temperature for sustained work can be difficult, as the body will start to cool as soon as work is stopped or if protective clothing is removed and evaporation rates are increased. Monitor personnel as soon as possible to obtain an accurate temperature following the manufacturer's instructions for the particular instrument used. A body core temperature greater than 101.3° F (38.5° C) for medically selected and acclimatized personnel, or greater than 100.4° F (38° C) in unselected, unacclimatized workers may mark excessive heat strain and an individual's exposure to heat stress should be discontinued.

Average Body temperature varies between individuals and within individuals, typically fluctuating 1 degree F above or below the scientific "norm" of 98.6° F (37° C) oral temperature, depending on activity and general health.

Temperatures taken at the ear (tympanic temperature) has been developed. Current information indicates that an ear temperature reading will be 0.5 to 1.0° F (0.3 to 0.6° C) higher than an oral temperature reading, since the eardrum shares blood supply with the hypothalamus in the brain. An armpit (axillary) temperature is typically 0.5 to 1.0° F (0.3 to 0.6° C) lower than an oral temperature reading and may take up to 10 minutes to get an accurate reading.

Temporal or forehead thermometers use skin temperature to determine the body temperature. Due to the variations of the location and effects of evaporation, these are not as accurate as electronic and ear thermometers, however they offer other benefits of speed and accessibility when an individual may be fully suited.

Take the oral, ear or temporal temperature immediately at the start of the rest period. If the temperature exceeds 99.5° F $(37.5^{\circ}$ C) (oral or adjusted to oral) shorten the next work period by a third. Do not return the worker to hot work in semi-permeable or impermeable clothing until the body temperature is less than 99.5° F $(37.5^{\circ}$ C).

Body temperatures may be taken with disposable oral thermometers or infrared ear drum scanners. Temporal infrared thermometers are also available and may be considered to be less intrusive to the workers than oral or ear measurement devices.

(Note- Instruments coming in contact with skin or body fluids (sweat, saliva, etc) should either be used with disposable covers or sanitized between use.)

5.4 Removal from Exposure

If an individual requires a shortening of the work period on more than two consecutive monitoring periods, or repeatedly over a few days, they should be removed from exposure to hot environments, wearing semi-permeable, impermeable protective clothing until examined and cleared for such work by the consulting physician.

If a worker appears to be disoriented or confused, suffers inexplicable irritability, malaise, or chills, the worker should be removed for rest in a cool location with rapidly circulating air and kept under skilled observation. Absent medical advice

to the contrary, treat this as an emergency with immediate transport to a hospital. An emergency response plan is necessary.

The heat stroke victim is often manic, disorientated, confused, and delirious or unconscious. treat this as an emergency with immediate transport to a hospital. The victim's body core temperature is greater than 104° F (40° C). If signs of heat stroke appear, start aggressive cooling immediately. Emergency care and hospitalization are essential. An emergency response plan is necessary.

Prolonged increases in deep body temperature and chronic exposures to high level of heat stress are associated with other disorders, such as temporary infertility (male and female), elevated heart rate, sleep disturbance, fatigue and irritability. During the first trimester of pregnancy, a sustained core temperature greater than 102.2° F (39° C) may endanger the fetus.

ATTACHMENT 3

COLD STRESS MONITORING AND WORK/RECOVERY REGIMENS

1.0 INTRODUCTION

Cold Stress TLVs are intended to protect workers from the severest effects of cold stress (hypothermia) and cold injury and to describe exposures to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV Objective is to prevent the deep body temperature from falling below 96.8° F (36° C) and to prevent cold injury to body extremities. For a single, occasional exposure to a cold environment, a drop in the core temperature to no lower than 95° F (35° C) should be permitted. In addition to provisions for total body protection, the TLV objective is to protect all parts of the body with emphasis on hands, feet, and head from cold injury.

This attachment includes guidance for monitoring and preventing cold stress in accordance with the 2007 ACGIH.

2.0 COLD STRESS EVALUATION AND CONTROL

Workers that will subject to working in cold environments should be familiarized with the symptoms and effects of cold work. This should include awareness of the effects of medication, use of alcohol on the worker, as well as recognizing the symptoms of frostnip, frostbite, and hypothermia.

The ESS with support by the PESM should evaluate the workplace conditions and implement the controls appropriate for the work being performed and the work environment.

2.1 Thresholds

For exposed skin, continuous exposure should not be permitted when the air speed and temperature results in an equivalent chill temperature of -25.6° F (-32° C). Superficial or deep local tissue freezing will occur only at temperatures below 30.2° F (-1° C) regardless of wind speed. Table 1provides the Equivalent Chill Temperatures on exposed flesh.

At air temperatures of 35.6° F (2° C), or less, it is imperative that workers who have become immersed in water or whose clothing becomes wet be immediately provided a change of clothing and treated for hypothermia.

Special protection of the hands is required to maintain manual dexterity for the prevention of accidents, including:

- If fine work is to be performed with bare hands for more than 10-20 minutes in a temperature below 60.8° F (16° C), special provisions should be made for keeping workers hands warm, such as warm air jets, radiant heaters or contact warm plates. Metal handles of tools and control bars should be covered with thermal insulating materials below 30.2° F (-1° C).
- If the air temperature falls below 60.8° F (16° C) for sedentary, 39.2° F (4° C) for light, 19.4° F (-7° C) for moderate work, and fine manual dexterity is not required, then gloves should be used by workers.
- To prevent frostbite, the workers should wear anti-contact gloves.

- When cold surfaces below 19.4° F (-7° C) are probable, a warning to workers should be given to prevent inadvertent contact by bare skin.
- If air temperatures are 0° F (-17.5° C) or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so they can be handled and used without removing the mittens.

Provisions for additional total body protection are required if work is performed in an environment at or below 39.2° F (4° C), including:

- Workers should wear cold protective clothing appropriate for the level of cold and physical activity.
- If the air velocity at the work site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.
- If only light work is involved and the worker may become wet on the job site, the outer type of clothing in use may be of a type impermeable to water. With more severe work under such conditions, the outer layer should be water repellent and the outerwear changed as it becomes wetted. Outer garments should have provisions for easy ventilation in order to prevent wetting of inner layers by sweat. If a worker's clothes have become wet by sweat, the worker should change into dry clothes before entering the cold area. Workers should change socks and any removable liners or felt insoles at regular daily intervals, or use vapor barrier boots.
- If exposed area of the body cannot be protected sufficiently to prevent sensation of excessive cold or frostbite, protective items should supplied in auxiliary heated versions.
- If the available clothing does not give adequate protection to prevent frostbite or hypothermia, work should be modified or suspended until adequate clothing is available or until weathers conditions improve.
- Workers handling evaporative liquids (gasoline, alcohol, etc) at air temperatures below 39.2° F (4° C) should take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporate cooling.

2.2 Work Warming Regimens

For work performed continuously in the cold at an equivalent chill temperature (ECT) or below 19.4° F (-7° C), heated warming shelters should be made available nearby with workers encouraged to use these shelters at regular intervals. The frequency of use should be dependent of the severity of the exposure. Table 2 provides a Work/Warm-up schedule for a four-hour schedule.

The onsite of shivering, minor frostbite, the feeling of excessive fatigue, drowsiness, or euphoria are indications for immediate return to the shelter. When entering the heated shelters, outer clothing should be removed and the remainder of clothing loosened or opened to permit sweat evaporation or a change of dry clothing provided.

Dehydration occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee or other diuretics should be limited.

For work practices at or below 10.4° F (-12° C) the following should be considered:

- Workers should be under constant protective observation (buddy system or supervision)
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing. If heavy work must be performed, rest periods should taken in heated shelters and the opportunity for changing into dry clothing provided.

- New employees should not be required to work fulltime in the cold during the first few
 days until they become accustomed to the working conditions and the required protective
 clothing.
- The weight and bulkiness of clothing should be factored into the estimates of required work performance and weights to be lifted by the worker.
- Work should be organized so that sitting still or standing still for long periods is minimized. Unprotected metal chairs should not be used. The worker should be protected from drafts to the greatest extent possible.
- Eye protection for workers employed out-of-doors in a snow or ice covered condition should be supplied. Special safety goggles to protect against ultraviolet light and glare that can cause temporary conjunctivitis and or temporary loss of vision, and blowing ice crystals when there is an expanse of snow coverage.
- Workers should be instructed in safety and health procedures related to cold environments work, including:
 - o Proper rewarming procedures
 - First aid treatment
 - Proper eating and drinking habits
 - Recognition of impending frostbite
 - Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
 - Safe work practices

2.3 Workplace Monitoring

Suitable thermometry should be arranged at the any workplace where the environment is below 60.8° F (16° C) so that overall compliance with the TLV can be maintained. Whenever the air temperature falls below 30.2° F (-1° C), the dry bulb temperature should be measured and recorded at least every 4 hours.

Wind speed should be monitored and recorded when the rate exceeds 5 mph (2 m/s). When monitoring, the Equivalent Chill Temperature (ECT) should be recorded with the temperature and wind speed.

Individual employees should be excluded from working in cold at 30.2° F (-1° C) or below if they are suffering from diseases or taking medication which interferes with normal body temperature regulation or reduces tolerance to work in cold environments. Workers who are routinely exposed to temperatures below -11.2° F (-24° C) with no wind, or -18° F (0° C) with wind speeds above 5 mph should be medically evaluated as suitable for such temperatures.

Provisions for providing first aid for trauma sustained in freezing or subzero conditions are required because an injured worker is predisposed to cold injury and should be protected against preventing hypothermia or freezing of damaged tissues in addition to providing the first aid.

Table 1 - Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)*

Estimated		Actual Temperature Reading (° F)										
Wind Speed (in mph)	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
mpm)	Equivalent Chill Temperatures (° F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
Wind Speeds > 40 mph have little additional Effect	In < hr Maxim		skin. ger of fa	ılse	INCREASING DANGER Danger from freezing of exposed flesh within one minute GREAT DANGER Flesh may freeze within 30 seconds						in 30	
	temper	Trenchfoot and immersion foot may occur at any point on this chart Grayed areas = Equivalent Chill Temperature requiring dry clothing to maintain core body temperature above 96.8° F (36° C) per cold stress TLV										

^{*} Developed by U.S Army Research Institute of Environmental Medicine, Natick, MA. As provided in American Conference Of Governmental Industrial Hygienists TLVs and BEIs 2006

TABLE 2 - WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT

	perature ly Sky		iceable ind		n Wind k/hr)		ph Wind K/hr)		15 mph Wind (24 k/hr)		ph Wind ? k/hr)
°F (Approx)	°C (Approx.)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max Work Period	Number of Breaks	Max Work Period	Number of Breaks	Max Work Period	Number of Breaks
-15 to -19	-26 to -28	Normal breaks	1	Normal breaks	1	75 min.	2	55 min.	3	40 min.	4
-20 to -24	-29 to -31	Normal Breaks	1	75 min.	2	55 min.	3	40 min	4	30 min.	5
-25 to -29	-32 to 34	75 min.	2	55 min.	3	40 min.	4	30 min.	5	5 Non-Emergency work should cease	
-30 to -34	-35 to -37	55 min.	3	40 min.	4	30 min.	5		Non-Emergency work should cease		
-35 to -39	-38 to -39	40 min.	4	30 min.	5	Non-Eme work sho	ergency ould cease				
-40 to -44	-40 to -42	30 min.	5	Non-Emer	gency work ase						
-45 & below	-43 & below	work	ergency should ase								

Notes:

1 Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of ten (10) minutes in a warm location and with an extended break (e.g. lunch) at the end of the 4-hour work period in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step low. For example, at -30 F (-35 C) with no noticeable wind (step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (step 5).

- 2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph light flag moves, 10 mph light flag fully extended, 15 mph raises newspaper sheet, 20 mph blowing & drifting snow.
- 3. TLVs apply only for workers in dry clothing.

Attachment 4 Example WBGT Monitoring Form



TETRATECH EC, INC.

HEAT STRESS MONITORING LOG

	WBGT Location:		
ИΕ	WBGT	AIR TEMP	NOTES & NOTIFICATIONS
– Wet Bulb G rain potential	lobe Tempera Worker Body	ture Core Temp: 101.3 F f	or acclimated Workers, 100.4 F for una

Tetra Tech EC, Inc. EHS 4-6 Temperature Extremes, Attachment 5 Proprietary Information Company Procedures

EHS 5-1: Personal Protective Equipment

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 06/21/2000

The purpose of this program is to ensure that personal protective equipment (PPE) is selected in accordance with 29 CFR Purpose:

1910.132, properly used and maintained, and that Tetra Tech EC, Inc. (TtEC) personnel are properly trained in the

inspection, use and maintenance of PPE.

06/30/2000 - Revised Version **Original Issue Date:**

Date:

ESQ - Environmental Health & Safety Programs

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1.0 PURPOSE

The purpose of this program is to ensure that personal protective equipment (PPE) is selected in accordance with 29 CFR 1910.132, properly used and maintained, and that Tetra Tech EC, Inc. (TtEC) personnel are properly trained in the inspection, use and maintenance of PPE.

2.0 SCOPE

This program applies to all TtEC operations including the activities of contractors on TtEC-managed projects.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITION



4.1 Personal Protective Equipment (PPE)

Items which are worn and are designed to protect the health and safety of an employee. This includes, but it is not limited to, chemical resistant shoes, boots, gloves, chemical protective clothing, hard hats, safety glasses, hearing protection, cooling/heating vests, life-lines and harnesses, and respirators. Additional program requirements for respirators are provided in EHS 5-2, Respiratory Protection.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 All TtEC Personnel

All personnel required to use PPE are responsible for wearing the appropriate PPE when required, inspecting the PPE prior to use, properly wearing the PPE, and as necessary, properly maintaining the PPE.



5.1.2 Line Management

Site supervisors are responsible for understanding the specific PPE requirements for each project task and ensuring that PPE is provided and worn when required and in the intended manner.



5.1.3 Environmental, Health and Safety Personnel

The Project Environmental and Safety Manager (PESM) is responsible for:

- Ensuring that PPE is selected in accordance with the hazard assessment requirements of 29 CFR 1910.132(d)
- Approving changes to PPE requirements through plan modifications or by incorporating criteria into the project plan which enable the Environmental and Safety Supervisor (ESS) to authorize changes to the PPE requirements.

ESS is responsible for:

- Monitoring PPE usage
- Recommending modifications to PPE requirements to project management and the PESM, as necessary
- Ensuring that project personnel have the proper training on the PPE which they are required to use, and performing training and retraining, as necessary

Providing notifications to laundries which clean TtEC work clothing in accordance with 29 CFR 1910.120(k)(7).



5.2 Intended Use

PPE is intended for use when engineering controls, procedures, and/or work practices are not feasible, when control measures are shown to be ineffective for exposure minimization, when uncertainty exists regarding the nature and level of potential exposure, and as a precautionary measure to prevent exposure due to accidental releases of hazardous materials.



5.3 Hazard Assessment and Selection

Hazard assessments shall be performed during the preparation of all Environmental, Health and Safety (EHS) plan. See EHS 3-2 for a discussion of EHS Plans. The hazard assessment shall include consideration for:

- Potential chemical, physical and biological hazards present
- · Work operations to be performed,
- Potential routes of exposure,
- · Concentrations of contaminants present, and
- Characteristics, capabilities and limitations of PPE, and any hazards that the PPE presents or magnifies such as heat stress.

The EHS plan shall be used as the written documentation of the hazard assessment to comply with 29 CFR 1910.132(d)(2), and shall include the identification of the workplace evaluated, the person certifying that the evaluation has been performed, and the date(s) of the hazard assessment.



5.4 PPE Requirements

All PPE shall be of safe design and construction for the work to be performed and shall meet applicable ANSI standards and/or OSHA regulations.

PPE used exclusively for site work shall be provided at no cost to TtEC personnel. Leather safety shoes <u>and</u> prescription safety glasses are not provided to personnel by TtEC.

The office or site person responsible for issuance of PPE shall ensure that PPE properly fits each affected employee except that proper respirator fit will be evaluated in accordance with EHS 5-2, Respiratory Protection.

Eye and/or face protection shall be provided when hazards exist from flying particles, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation. Regarding eye and/or face protection:

- Side shields shall be used whenever site plans require the use of safety glasses. Employees who wear prescription lenses must use ANSI approved industrial prescription safety glasses with fixed side shields and/or prescription inserts for full face respirators as necessary to meet project requirements. The cost of eye examinations is the responsibility of the employee.
- Filter lenses for operations which involve injurious light radiation shall be in accordance with 29 CFR 1910.133(a)(5).
- A full face respirator is required whenever operations involve corrosive liquids and the operation requires the use of a respirator to provide for maximum eye protection; if the operation does not require a respirator, then splash goggles at a minimum shall be worn. Face shields are not a substitute for splash goggles.

Hard hats shall be provided whenever hazards from falling objects, overhead hazards, low clearance hazards exist, or required by project EHS plans.

Provisions shall be made in office locations for personnel to store and transport PPE required for field projects. Individuals shall be provided with equipment and an equipment bag large enough to hold the PPE normally required for the field projects which they support.



5.5 Work Clothing

TtEC's work uniform shall be cotton coveralls for personnel performing field work at hazardous waste sites. Exceptions to the cotton coverall requirement can be made by the PESM when the risk of contaminating personal clothing is remote. Personnel should not wear their personnel clothing (other than undergarments and socks) under the cotton coveralls. Attachment A or an equivalent shall be used to notify the laundry.

Home laundering of company-provided work clothing is not allowed. Each office or project shall provide for laundering of work clothing. When an outside laundry service is utilized, the laundry shall be notified in accordance with 29 CFR 1910.120(k)(7). The sample letter included as Attachment A shall be used as a template for notification of laundries.

If work clothing becomes grossly contaminated with a hazardous material, i.e., requiring removal to prevent prolonged skin contact, the uniform is to be disposed of in the appropriate manner. Under no circumstances should grossly contaminated work clothing be taken home or sent to an outside laundry.



5.6 Inspection

Each employee is responsible for inspecting his/her PPE before and after each use.

Any damaged or defective PPE is to be taken out of service immediately, and repaired or replaced.

The Emergency Coordinator is responsible for ensuring that PPE maintained for emergency use is inspected as necessary.



5.7 Cleaning, Maintenance, and Disposal

Used, disposable PPE items are placed in containers at job sites for disposal. The PESM shall determine the proper method of disposal.

Non-disposable items such as hard hats and rubber boots are to be decontaminated at the job site. Personnel are responsible for cleaning their own PPE after each work shift unless other arrangements are made for the project. Site-specific cleaning procedures are listed in the EHS plans for each job site.

Non-disposable PPE is stored in the employees' lockers, equipment bags, or other suitable locations when not in use.



5.8 Medical Evaluation

Medical surveillance examinations for personnel required to wear PPE will include an evaluation of the person's ability to tolerate the physical stresses posed by protective equipment. See EHS 4-5, Medical Surveillance, for additional information regarding the TtEC medical surveillance program.



5.9 Training



5.9.1 Initial Training

Training in PPE inspection, use and maintenance is conducted as part of the initial hazardous waste 40-hour training. This training provides personnel with an understanding of the inspection, use (including donning, doffing, adjusting, and wearing), limitations, care, and maintenance of PPE.



5.9.2 Site-Specific Orientation

Site-specific orientations shall be used to communicate selection decisions to site personnel to meet the requirements of 29 CFR 1910.132(d)(1)(ii). The site-specific orientation shall ensure that site personnel:

• Understand when PPE is necessary, what PPE is necessary, the limitations of the PPE, and the proper disposal of the PPE;

- Understand how to use the specific PPE required by the project; and
- Has retained the basic PPE knowledge from the initial training.



5.9.3 Retraining

Retraining shall be performed:

- Whenever TtEC personnel have reason to believe that a person does not have the requisite understanding and skill to properly and safely use PPE;
- When changes in the workplace or work plans require modifications to the types of selected PPE; and
- As necessary, to inform TtEC personnel of changes to the requirements of this program.



5.10 Documentation

PPE training shall be documented through a written certification that contains the name of each person trained, the date(s) of the training, and the identification of the subject of the certification. Training certification may be accomplished as follows:

- For initial, supervisor and refresher training, TtEC shall maintain a copy of the course agenda in conjunction with the course certificate.
- For site-specific orientation, site-specific training and required retraining, the training sign-in sheet shall contain the required information identified above.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.



6.0 REFERENCES

29 CFR 1910.120(k)(7), Hazardous Waste Operations and Emergency Response.

29 CFR 1910.132, Personal Protective Equipment, General Requirements.

29 CFR 1910.133, Personal Protective Equipment, Eye and Face Protection.

29 CFR 1910.134, Respiratory Protection.

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping

Environmental, Health & Safety - Programs Procedure EHS 3-2, Environmental, Health & Safety Plan(s)

Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance

Environmental, Health & Safety - Programs Procedure EHS 5-2, Respiratory Protection 🔾

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)



7.0 ATTACHMENTS

Attachment A - Laundry Notification Letter



EHS 5-1 ATTACHMENT A LAUNDRY NOTIFICATION LETTER

Click the icon below to launch or download.



EHS 5-1 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

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EHS 5-1 ATTACHMENT A



LAUNDRY NOTIFICATION LETTER

Date

XYZ Laundry Clean Street Whitewash, NJ 12345

To Whom It May Concern:

The purpose of this letter is to inform you of the nature of the operations at Tetra Tech EC, Inc. (TtEC) ABC Project, to provide you with information on the site contaminants, and to document the notification required by OSHA 29 CFR 1010.120(k)(7).

TtEC's ABC Project involves the (Provide information on the general scope of the project in two or three sentences).

The known contaminants at the site include (Provide or attach a listing of the known site contaminants). The levels of these contaminants in the (State media) are (Describe general levels of contaminants). The potential health hazards of from these contaminants are (Describe potential health hazards from exposure or attach information from the HASP).

Personnel at this site wear outer disposable clothing which minimizes contamination of the clothing which you receive for laundering. (Modify previous sentence if disposable clothing is not worn or not worn for all job tasks. When disposable clothing is not worn, explain why not and why contamination of the clothing would be minimal.) In addition, any clothing which becomes grossly contaminated will be disposed of in an appropriate manner and will not be sent to you for laundering.

Please provide your employees with the above information. If you have any questions, do not hesitate to contact me or (Name of PESM or ESO).

Sincerely, TETRA TECH EC, INC.

John Smith Project Manager

cc: Project EHS File

Revision Date 04/03/04 1

EHS 5-2: Respiratory Protection

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 02/29/2000

Purpose: The purpose of this program is to establish minimum requirements for the proper selection, use, and care of respiratory

protection equipment by workers at Tetra Tech EC, Inc. (TtEC) project sites and to ensure compliance with OSHA, 29 CFR

. 1910.134.

Version Date:

04/04/2000 - Revised

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02/01/95

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Index:

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1.0 PURPOSE

The purpose of this program is to establish minimum requirements for the proper selection, use, and care of respiratory protection equipment by workers at Tetra Tech EC, Inc. (TtEC) project sites and to ensure compliance with OSHA, 29 CFR 1910.134.



2.0 SCOPE

This program applies to all TtEC operations.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Hazardous Atmosphere

Any atmosphere containing a potentially toxic gas, vapor, dust, fume, mist, or pesticide, or any oxygen-deficient atmosphere.



4.2 Oxygen-Deficient Atmosphere

An atmosphere containing less than 19.5 percent oxygen by volume at sea level.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Line Management

Site supervisors are responsible for ensuring that the proper respiratory protective equipment (RPE) is used when required in accordance with the site Environmental, Health and Safety (EHS) plans in the intended manner.



5.1.2 Environmental, Health and Safety Personnel

The Environmental and Safety Coordinators (ESC) are responsible for ensuring that personnel based in their office receive annual training and fit testing for RPE.

The Project Environmental and Safety Manager (PESM) is responsible for selection and specification of RPE in accordance with the requirements of this program, EHS 5-1 (Personal Protective Equipment) and EHS 3-2 (EHS Plans), and applicable regulations.

The Environmental and Safety Supervisor (ESS) is responsible for:

- Ensuring that personnel have the necessary training and fit testing for the use of each type of respirator and ensuring that proper documentation is available
- . Monitoring the use of RPE
- Ensuring that RPE is maintained and inspected in accordance with the EHS plans and program requirements
- Evaluating the effectiveness of the respiratory protection program on each site, and
- Recommending changes to the types of RPE being used, as necessary.



5.1.3 Corporate Medical Consultant

The Corporate Medical Consultant (CMC) is responsible for providing clearance for TtEC personnel to use RPE in accordance with EHS 4-5, Medical Surveillance.



5.2 Selection of Respiratory Protective Equipment

All respiratory equipment utilized on TtEC projects shall be certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH). The type of respiratory protection selected is based upon potential hazards at a specific site. Selection of appropriate respiratory protection is documented in the EHS plans (see procedure PO-1, Project Management Planning.) and approved by the ESQ Regional Manager, PESM and/or a Certified Industrial Hygienist.

There are three general classes of respiratory protection available:

- Self-contained breathing apparatus (SCBA),
- Air-supplied devices, and
- Air-purifying devices.

To select which type of respiratory protection is appropriate for a given project, the following questions must be answered:

- 1. Is there a possibility of an oxygen-deficient atmosphere?
- 2. Are the contaminants and concentrations in the worker breathing zones known or unknown?
- 3. What are the allowable concentration limits (permissible exposure limits or threshold limit values) for the contaminants? What are their physical properties?
- 4. What are the maximum expected concentrations of known contaminants? Are the concentrations Immediately Dangerous to Life and Health (IDLH)?
- 5. What is the expected duration of personnel exposure?
- 6. What are the warning properties and symptoms of the contaminants?
- 7. Can the contaminant be absorbed through the skin and/or eyes?
- 8. Are the contaminants flammable?
- 9. Is there any other pertinent information concerning the contaminants that may be pertinent to selecting appropriate respiratory protection?

Atmosphere-supplying respirators (i.e., pressure demand SCBAs or airline systems) shall be used when one of the following occurs: 1) the hazardous substance has been identified and requires the highest level of protection based on the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; 2) site operations involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates; or 3) operations are being conducted in confined, poorly ventilated areas that could contain hazardous concentrations of atmospheric vapors, gases, or particulates and/or reduced oxygen concentrations less than 19.5 percent. Escape packs are used with all airline systems. Note: Employees shall not be required to enter atmospheres that are immediately dangerous to life or health without the approval of the Project Environmental and Safety Manager, or without specific hazardous atmosphere rescue training.

Negative pressure air purifying respirators, equipped with appropriate filter cartridges for the expected contaminants, may be used only when the atmospheric contaminants have been identified, and expected concentrations are within limits that can be effectively removed by the respirator cartridges. For air purifying respirators used for protection against gases or vapors, a cartridge change schedule shall be included in the EHS Plan along with a description of the information or data relied upon to develop the schedule. In most cases this will consist of recommendations by the manufacturers when they become available.



5.3 Fit Testing

A qualitative fit test shall be conducted for each employee during the initial 40-hour health and safety training course and/or at site-specific training and annually thereafter. Fit testing may also be performed when a condition that may effect the face fit of the respirator has occurred, such as weight gain or loss, dental work, facial surgery, or deformity. Employees shall be clean shaven during fit testing.

Qualitative fit tests shall be administered using irritant smoke or Bitrex in accordance with the OSHA respiratory protection

standard in 29 CFR 1910.134, Appendix A. (Attachment A of this procedure contains the protocol for the irritant smoke test. If using the Bitrex test kit, follow the protocol in the OSHA standard.)

Qualitative Fit testing will be limited to situations where a negative pressure respirator is used and a protection factor of 10 or less is needed. If a protective factor of greater than 10 is needed, the EHS plan will require either a positive pressure/pressure demand respirator or quantitative fit-testing of the negative pressure respirator.

All positive pressure/pressure demand respirators with tight-fitting facepieces will be fit-tested qualitatively or quantitatively in the negative pressure mode.

A record of the fit test shall be maintained utilizing the qualitative respirator fit test record form (Attachment B). Records of employee respiratory protection training shall be maintained by each office ESC and by the ESS in each project file.



5.4 Respirator Use

All TtEC personnel are required to:

- Use RPE when required and in the proper manner;
- Inspect RPE prior to each use and obtain replacement equipment when found to be defective;
- Perform a user seal check each time they put on a tight-fitting respirator;
- · Take proper care of the RPE;
- Be clean shaven where the seal of the respirator contacts the face whenever using RPE; and
- Leave the respirator use areas whenever necessary to wash their face or respirator to avoid skin irritation; if they detect contaminant breakthrough, a change in breathing resistance, or leakage of the facepiece; or to change filters or cylinders.

Low temperatures may fog the lenses of the respirator and use of anti-fog spray and a nose cup may be beneficial. Nose cups are part of the NIOSH approval for air supplied respirators at ambient temperatures of 32° F and below. Minimum temperatures recommended by the manufacturer for operation of a SCBA shall be consulted prior to use in low temperatures.

Under no circumstances are employees permitted to use escape provisions of atmosphere-supplying respirators for routine and egress of work areas.

Wearing any respirator in conjunction with other types of protective equipment will impose some physiological stress on the wearer. Use of respirators in conjunction with protective clothing can greatly affect human response and endurance, especially in hot environments. See EHS 4-6, Temperature Extremes, for additional information.



5.5 Cleaning and Storage

Each person has the responsibility to clean, disinfect, and care for their respirator in accordance with the training they have received. The following procedure shall be followed for cleaning and storage of respiratory protection equipment.

- Personal respirators shall be cleaned and disinfected after each day's use, or more frequently, if necessary.
- Respirators for emergency use and all SCBAs shall be cleaned and inspected after each use, and inspected on a monthly basis. Monthly inspections shall be documented, including serial number, date, findings, and remedial action and signature inspector.
- Routine cleaning shall be completed as follows:
 - Remove the filters and dispose of per the EHS plan's requirements, if applicable.
- Wash respirator in disinfecting solution.
- Rinse respirator in clean water.
- Allow respirator adequate time to air dry.
- Routine inspection shall be completed as follows:
 - Check all connections for gaskets and "O" rings and proper tightness.
 - Check the condition of the face piece and its parts for tears, cracks, abrasions, or brittleness.
 - Check the condition of the connecting air hose, regulator, and harness, if applicable.
 - Check the condition of the headband for tears, cracks, abrasions, or brittleness.
 - Inspect all rubber or elastic parts for pliability and signs of deterioration.

- Check alarms, if applicable
- Report any worn, missing, or broken parts to health and safety personnel on site.
- Clean and dry respirators shall be stored in zippered plastic bags. These bags shall be placed in a clean, dry place out of direct heat and sunlight.
- Repairs and parts replacements will only be made by individuals trained to do so using only the manufacturer's NIOSH approved parts. Only manufacturers or technicians trained by the manufacturer can repair\replace reducing and admission valves, regulators and alarms.



5.6 Air Monitoring of Work Areas

To determine if the selected respiratory protection is appropriate, the work area shall be monitored for contaminant concentrations at the beginning of each phase of work activity as required by the site safety plan. Sampling should be in the breathing zone of the exposed employee. Periodic sampling throughout the project will be conducted per the EHS plans to ensure that the selected respirator protection is appropriate.



5.7 Evaluation of the Program

Site supervisors and the ESS shall monitor the project implementation of the respiratory program during routine and informal inspections. PESM will perform evaluations of project implementation of the program during EHS inspections. The inspections shall include consultation with affected employees required to use respirators. The Director, Health and Safety Programs will evaluate overall program implementation through a review of inspection reports, incident reports and investigations, and audit reports.

See C-2, Audits, and EHS 3-3, Inspections, for information on the TtEC audit and inspection programs.



5.8 Medical Surveillance

Site personnel shall meet the medical surveillance requirements of OSHA 29 CFR 1910.134, 1910.120 and EHS 4-5, Medical Surveillance, for respirator use prior to engaging in any field work requiring or potentially requiring the use of a respirator. Personnel with medical conditions which prevent or limit their ability to wear a respirator shall be notified in writing by the CMC.



5.9 IDLH Atmospheres

TtEC personnel shall immediately evacuate areas where an IDLH atmosphere develops. TtEC personnel shall not enter IDLH atmospheres except for rescue or when authorized by the PESM. If necessary, at least one standby person equipped with proper rescue equipment and a pressure demand SCBA is present. Communication between the field team and the standby person is maintained at all times. If the IDLH atmosphere exists in a confined space, the entry shall be conducted in accordance with EHS 6-1, Confined Space Entry.



5.10 Training

Personnel required to use respiratory protection shall be trained in the selection, use, and maintenance of the equipment. Respiratory protection training is included as part of the initial health and safety training, the 8-hour refresher course, and the site-specific training described in EHS 1-11, Training. The training shall be conducted annually. Site-specific respiratory protection training includes the following:

- Hazard identification to include symptoms of exposure;
- Use of engineering controls to minimize exposure, and an explanation of why engineering controls are not feasible;
- A description of the type of respiratory protection chosen and the protection provided to the employee;
- Assurance that the employee understands the protection capabilities and limitations of the method of respiratory protection utilized:

- Recognition of medical signs and symptoms that may limit or prevent effective use of respirators;
- A thorough demonstration of the selected method of respiratory protection to include how to put it on, how to check the seals, use, troubleshooting, and maintenance followed by hands-on training by the employee;
- How to use the respirator in an emergency, including situations in which the respirator malfunctions; and
- A description of the on-site storage and maintenance facilities for maintaining respiratory protection equipment.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.



6.0 REFERENCES

29 CFR 1910.120, Hazardous Waste Operations and Emergency Response. 29 CFR 1910.134, Respirator Protection.

Compliance Procedure C-2, Audits

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping

Environmental, Health & Safety - Programs Procedure EHS 1-11, Training 🗓

Environmental, Health & Safety - Programs Procedure EHS 3-2, Environmental, Health & Safety Plan(s)

Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections 🗔

Environmental, Health & Safety - Programs Procedure EHS 4-5, Medical Surveillance 🗓

Environmental, Health & Safety - Programs Procedure EHS 4-6, Temperature Extremes

Environmental, Health & Safety - Programs Procedure EHS 5-1, Personal Protective Equipment 🗓

Environmental, Health & Safety - Programs Procedure EHS 6-1, Confined Space Entry 🗓

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)

Project Initiations/Operations Procedure PO-1, Project Management Planning



7.0 ATTACHMENTS

Attachment A - Irritant Fume Protocol
Attachment B - Qualitative Respirator Fit Test Form

EHS 5-2 ATTACHMENT A IRRITANT FUME PROTOCOL

Click the icon below to launch or download.



EHS 5-2 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

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EHS 5-2 ATTACHMENT B
QUALITATIVE RESPIRATOR FIT TEST RECORD

Click the icon below to launch or download.



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EHS 5-2 ATTACHMENT A

TETRA TECH EC, INC. IRRITANT FUME PROTOCOL

- 1. The test subject shall be allowed to smell a weak concentration of the irritant smoke to familiarize him with the characteristic odor of each.
- 2. The test subject shall properly don the respirator selected as above, and wear it for at least 10 minutes before starting the fit test.
- 3. The test conductor shall review this protocol with the test subject before testing.
- 4. The test subject shall perform the conventional positive pressure and negative pressure fit checks. Failure of either check shall be cause to select an alternate respirator.
- 5. Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low pressure air pump set to deliver 200 milliliters per minutes.
- 6. Advise the test subject that the smoke can be irritating to the eyes and instruct him to keep his eyes closed while the test is performed.
- 7. The test conductor shall direct the stream of irritant smoke from the tube towards the faceseal area of the test subject. The test conductor shall begin at least 12 inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.
- 8. The following exercises shall be performed while the respirator seal is being challenged by the smoke. Each shall be performed for one minute.
 - i. Normal breathing.
 - ii. Deep breathing. Be certain breaths are *deep* and *regular*.
 - iii. Turning head from side-to-side. Be certain movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have test subject inhale when his head is at either side.
 - iv. Nodding head up-and down. Be certain motions are complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his head is in the fully up position.
 - v. Talking slowly and distinctly, count backwards from 100, or read the rainbow passage which follows this protocol.
 - vi. Normal breathing.

EHS 5-2 ATTACHMENT A IRRITANT FUME PROTOCOL

- 9. If the irritant smoke produces an involuntary reaction (cough) by the test subject, the test conductor shall stop the test. In this case the tested respirator is rejected and another respirator shall be selected.
- 10. Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube to determine whether he reacts to the smoke. Failure to evoke a response shall void the fit test.
- 11. Steps B4, B7, B8 of this protocol shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the irritant smoke.
- 12. Respirator successfully tested by the protocol may be used in contaminated atmospheres up to ten times the PEL. In other words, this protocol may be used to assign protection factors not exceeding ten.

RAINBOW PASSAGE

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

EHS 5-2 ATTACHMENT B

TETRA TECH EC, INC. QUALITATIVE RESPIRATOR FIT TEST RECORD

Date of Test: Proj	ject/Location:		
Print Name:Prin	nt Tester's Name:		
	TEST 1	TEST 2	TEST 3
Respirator Manufacturer			
Model			
Facepiece style			
Size			
Type cartridge used for test			
Positive/negative pressure check (Pass or	Fail)		
Test agent (Irrititant fume or Isoamyl ace	tate)		
Sensitive to test agent (Yes or No)			
Normal breathing (Pass or Fail)			
Deep breathing (Pass or Fail)			
Moving head side to side (Pass or Fail)			
Speaking - (Pass or Fail)			
Bending (Pass or Fail)			
Jogging (Pass or Fail)			
Normal breathing (Pass or Fail)			
Passed test (Yes or No)			
I understand the limitations of the respirator (respirator; and, how to obtain information abwork. I also understand that it is my respon	out the respirator use requi	rements on the pro	oject(s) on which
Signature of Person Tested:			
The fit test(s) was performed according to th Respiratory Protection Program, EHS 5-2.	ne fit test procedure specifie	d in the Tetra Tec	h EC, Inc.
Signature of Tester			

I

EHS 6-1: Confined Space Entry

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 02/29/2000

Purpose: When required, this program provides the requirements to ensure a safe working environment within and around confined

space operations by evaluating confined space hazards, implementing necessary controls, and regulating employee entry

into confined spaces in accordance with 29 CFR 1910.146, Permit-Required Confined Spaces.

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1.0 PURPOSE

When required, this program provides the requirements to ensure a safe working environment within and around confined space operations by evaluating confined space hazards, implementing necessary controls, and regulating employee entry into confined spaces in accordance with 29 CFR 1910.146, Permit-Required Confined Spaces.

Confined space entries should only be made if there is not a feasible method of performing the task from outside of the confined space.



2.0 SCOPE

This program applies to all Tetra Tech EC, Inc. (TtEC) employees, operations, and subcontractors.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Acceptable Entry Conditions

The conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.



4.2 Attendant

An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.



4.3 Confined Space

An enclosed area which exhibits the following characteristics:

- Is large enough and so configured that an employee can bodily enter;
- Has limited or restricted means for entry or exit; and
- Is not designed for continuous occupancy.



4.4 Double Block and Bleed

The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.



4.5 Engulfment

The surrounding and effective capture of a person by a liquid or finely divided solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.



4.6 Confined Space Entry Permit

The completed document which specifies the hazards, controls, and procedures for a confined space entry.



4.7 Entry

The action by which a person passes through an opening into a confined space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.



4.8 Entry Supervisor

The person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.



4.9 Hazardous Atmosphere

An atmosphere which meets one or more of the following criteria:

- Flammable gas, vapor, or mist in excess of 10 percent of the lower explosive limit; or
- An airborne concentration of a dust at a concentration that meets or exceeds its lower explosive limit (rule of thumb visibility obscured at a distance of 5 feet); or
- Atmospheric concentration of any substance which could result in employee exposure in excess of its recommended exposure limit, i.e., Permissible Exposure Limit (PEL), Threshold Limit Value (TLV), or manufacturer's limit; or
- Immediately dangerous to life or health (IDLH).



4.10 Inerting

The displacement of the atmosphere in a permit space by a noncombustible gas to such an extent that the resulting atmosphere is noncombustible.



4.11 Isolation

A pre-entry requirement which assures that the confined space has been completely taken out of service and insures that accidental introduction of hazardous substances into the confined space may not take place. Isolation may include blinding, double blocking with bleed valves, capping, and/or lockout/tagout.



4.12 Line Breaking

The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.



4.13 Non-permit Required Confined Space

A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.



4.14 Oxygen Deficient

An atmosphere containing less than 19.5 percent oxygen by volume.



4.15 Oxygen Enriched

An atmosphere containing 22.0 percent or more oxygen by volume. (Note: The 22% upper limit is an NFPA 306k, Certification of Hot Work, Consensus Standard.)



4.16 Permit Required Confined Space

A confined space which has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfment of the entrant; or
- Has an internal configuration that could trap or asphyxiate an entrant.



4.17 Prohibited Conditions

Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.



4.18 Retrieval System

The equipment used for non-entry rescue of persons from permit spaces.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Authorized Entrants

Entrants are responsible for the following:

- Inspection of operability and integrity of all respiratory apparatus, safety equipment, and personal protective equipment (PPE) to be used/worn:
- Knowing hazards, mode of exposure, signs and symptoms, and consequences of hazardous exposure;
- Communicating with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space;
- Notifying the attendant of undetected / unnoticed hazards which could cause harm or injury to team personnel, warning signs and symptoms of exposure, and prohibited conditions;
- Wearing the designated respiratory apparatus, safety equipment, and PPE in accordance with EHS 5-2, Respiratory Protection and EHS 5-1, Personal Protective Equipment;
- . Knowing the emergency procedures; and
- Exiting from the permit space when evacuation is ordered, warning signs or symptoms of exposure are noted, a prohibited condition is noted, or an alarm is activated.



5.1.2 Attendants

Attendants are required to assume the following duties and responsibilities:

- Inspection of operability and integrity of all respiratory apparatus, safety equipment, and PPE to be used/work in accordance with EHS 5-2, Respiratory Protection and EHS 5-1, Personal Protective Equipment;
- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Be aware of possible behavioral effects of hazard exposure in authorized entrants;
- Communicate with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space;
- Leave their position only after being physically replaced by another attendant. If required to leave their post and no replacement is available, they must evacuate all personnel from within the confined space before leaving;
- Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and order the authorized entrants to evacuate the permit space immediately if a prohibited condition is noted, if an authorized entrant shows behavioral effects of a hazard exposure, if a saturation develops outside the confined space that may endanger the entrants, or if the attendant cannot effectively and safely perform his or her required duties;
- Summon rescue and emergency services;
- Warn unauthorized persons that they must stay away from the permit space, advise them to exit immediately if they enter the permit space, and inform the entry supervisor if they enter the space;
- · Perform non-entry rescues;
- Perform no duties that interfere with the attendant's primary duty to monitor and protect the authorized entrants;
- Remain in constant communication with the entrant at all times; and
- Perform atmospheric monitoring per the confined space permit under the direction of the entry supervisor, if trained to perform the monitoring.



5.1.3 Entry Supervisors

Entry supervisors have the following responsibilities:

• Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposures;

- <u>Verifies by checking</u> that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- Verifies that rescues services are available and that the means for summoning them are operable;
- Removes unauthorized individual who enter or who attempt to enter the permit space during entry operations;
- Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained;
- Ensures full compliance with TtEC and customer permit requirements;
- Ensures that all confined space pre-entry precautions have been taken;
- Ensures that atmosphere/personnel monitoring is performed at adequate frequencies to protect the safety and well being of the entry personnel;
- Ensures that emergency procedures and individual assignments are clearly defined, and to coordinate rescue procedures if necessary; and
- Terminates the entry and cancels the permit.

The entry supervisor may also serve as attendant.



5.1.4 Line Management

The Project Manager (PM) has the responsibility for:

- Ensuring implementation of the confined space entry program
- Ensuring that only trained, qualified, and medically fit personnel participate in confined space entry operations; and
- Ensuring that adequate, appropriate, and properly maintained equipment required to safely enter a confined space and successfully complete the task.



5.2 Procedure

The following sections provide the requirements for pre-entry activities, pre-entry briefings, confined space operations, and program review requirements. Complete implementation of these requirements is necessary to ensure the health and safety of personnel during confined space operations.

No entries shall be made into confined spaces with:

- IDLH atmospheres;
- LEL readings in excess of 10% or a combustible dust atmosphere in excess of the LEL; or
- An oxygen content of less than 19.5% or greater than 22.0%.



5.2.1 Hazard Evaluation

Prior to the initiation of a confined space entry, a hazard evaluation of the space shall be conducted by the entry supervisor to determine what chemical and physical hazards are present. This review shall be documented on the entry permit and include, but not be limited to the following:

- Potential for oxygen deficient or enriched atmosphere;
- Presence of a flammable atmosphere;
- Presence of toxic air contaminants;

- Presence of physical hazards;
- Sources of hazardous energy that must be de-energized to effectively isolate the confined space;
- Other permits, such as hot-work or lockout/tagout, required to control hazards; and
- Acceptable entry conditions.

Various sources of information for hazard identification that may be used include blueprints, as-builts, client employee knowledge, past entry information, air monitoring data, and physical inspection. For each hazard identified, an effective means of control shall be documented on the confined space entry permit.



5.2.2 Atmospheric Testing

The atmosphere of the confined space shall be tested to determine the initial concentrations of the following:

- Oxygen content;
- Flammable or combustible gases or vapors; and
- Toxic air contaminants.

Testing for the initial concentrations shall be conducted in the order given and documented on the entry permit. LEL, oxygen, and toxicity readings must be taken at least every 15 minutes. If isolation of the space is unfeasible because the space is large or part of a continuous system, the monitoring shall be continuous. Frequency for periodic monitoring during the confined space entry shall be specified and documented on the permit.



5.2.3 Ventilation

Mechanical ventilation shall be initiated where necessary to prevent exposure of employees to hazardous atmospheres. The ventilation shall meet the following requirements:

- It shall be continuous;
- It shall be directed into the immediate area authorized entrants shall work in;
- The air supply shall be from a clean source and shall not increase the hazards in the area; and
- Employees shall not enter the space until the ventilation clears the hazardous atmosphere.

When ventilation practices cannot be used, a supplied air respirator must be utilized. Exceptions may be made by the Project Environmental and Safety Manager (PESM).

Ventilation equipment must be bonded and grounded prior to operation. Ventilator exhausts must be directed down wind from personnel and/or areas that contain buildings, equipment, etc.



5.2.4 Isolation

All permitted spaces shall be removed from service and completely protected against the release of energy and material into the space. Means used to isolate the space include but are not limited to the following:

- Lockout/tagout in accordance with EHS 6-4;
- Disconnection of mechanical linkages and hazards;
- · Blanking, blinding, or misaligning piping; or
- Double blocking and bleeding.



5.2.5 Equipment Staging

The following equipment shall be available as necessary and inspected prior to use:

- · Testing and monitoring equipment;
- Ventilation equipment
- · Communications equipment;
- Personal protective equipment;
- Lighting equipment (caged, waterproof, and low voltage);
- · Barriers and shields;
- · Ingress and egress equipment;
- · Rescue and emergency equipment; and
- Any other equipment required to make safe entry into the space.

In spaces where the potential for flammable or combustible atmospheres exists, equipment shall be non-sparking and intrinsically safe. Electrical systems shall be GFCI protected.



5.2.6 Emergency and Rescue Procedures

Based upon the location, hazards, and configuration of the confined space, the entry supervisor shall ensure that the following items are addressed:

- Rescue and emergency services to be used and means of summoning;
- · Means of rescuing entrants;
- Rescue and emergency to be used at the site;
- Duties of personnel during emergencies; and
- Prevention of unauthorized entry during rescues.



5.2.7 Client/Contractor Coordination

To ensure safe and efficient operations when TtEC personnel and client or subcontractor employees will make entry together into the same confined space, the following shall be completed by the entry supervisor:

- Inform TtEC contractors of existing confined spaces;
- Provide TtEC contractors with a copy of this program;
- Inform the contractor of known hazards in the space;
- Provide a list of controls implemented previously;
- · Coordinate the entry of the personnel; and
- Debrief the contractor regarding this program and any hazards encountered.

When TtEC personnel are required to perform confined space entry in support of client work, the entry supervisor shall complete the following in addition to the above requirements:

- Obtain any available information on the space from the client;
- Coordinate the entry operations with client personnel; and

• Inform the client of entry hazards encountered.



5.2.8 Pre-Entry Briefing

Prior to initiating a confined space entry, the entry supervisor shall conduct a safety briefing with the authorized entrants, attendants, and other relevant personnel. The briefing shall cover the following at a minimum:

- Hazard Communication (including the signs, symptoms, and modalities of chemical over exposure) in accordance with EHS 4-2, Hazard Communications;
- · Physical hazards present;
- All hazard controls;
- Acceptable entry conditions;
- Emergency procedures;
- Rescue procedures;
- Duties of entrants and attendants during routine and emergency operations;
- Frequency and Types of air monitoring;
- Communications system and backup to be used;
- Review of work to be accomplished during entry;
- Decontamination procedures (if necessary);
- · PPE disposal; and
- Potential emergencies that may occur outside the confined space.

Attachment A or an equivalent checklist shall be used to document pre-entry briefing.

At the end of the briefing, all personnel shall be given opportunity to ask questions and review the permit. After review, each authorized entrant and attendant shall print and sign his/her name on the permit. The completed permit shall be posted at the entry site and serve as a roster for monitoring entry and exit of personnel from the space.



5.2.9 Confined Space Operations

The following practices shall be adhered to during actual confined space entries:

- All confined spaces will be treated as permit-required confined spaces unless the PESM specifically provides an exemption in the EHS Plan, or by a field change request to the Plan. Prior to entry, a properly executed permit shall be in place and signed by the Entry Supervisor, Attendant, and each Entrant. Attachment B, or an equivalent form that is approved for use by the PESM, shall be used.
 - The Entry Supervisor shall certify that all equipment is in place and operable, acceptable entry conditions are present, all
 personnel have been fully briefed and all personnel have signed the permit prior to initiating entry.
- The work area outside the space shall be barricaded to prevent unauthorized personnel from interrupting the attendants or entering the space. Unauthorized personnel shall be asked to leave the barricaded area. If unauthorized personnel refuse to leave the area, operations shall be terminated.
- Atmospheric monitoring for oxygen, LEL, and toxic air contaminants shall be conducted at the frequency noted on the permit.
 Results shall be logged on the permit.
- No confined space shall be entered without:
- A full body harness;
- A 6' lanyard attached to the harness "D" ring; and
 - A lifeline attached to the lanyard with the opposite end secured outside the confined space. The lanyard and lifeline
 must have double locking rings.

Note: Wristlets may be used in lieu of a full body harness if the body harness is infeasible or creates a greater hazard.

- Top entries with a fall potential greater than 5 feet shall be made with fall protection. Fall protection shall meet the criteria specified in 29 CFR 1926.502(d).
- At least one attendant is required for permit-required entries. The attendant shall maintain visual or voice communications with entrants at all times. Attendants shall not leave their post unless formally relieved by another authorized attendant. The replacement shall be fully briefed by the entry supervisor on all information covered in the pre-entry briefing. Entry supervisors may also serve as attendants.
- When any confined space is entered where the noise level or respirator used prevents voice communication, visual contact between the standby and workers must be maintained.
- Metal ladders, hand tools or other instruments which may spark or cause a source of ignition, are not to be used within confined spaces where any detectable amounts of LEL's are present.
- No burning, grinding, chipping, or other operation which produces heat, sparks, or ignition sources are to be performed without a hot work permit.
- One attendant shall be dressed in the same PPE as the authorized entrants, except for respiratory protection. Attendant supplied air shall be from a different source than that of authorized entrants.
- The entry supervisor shall terminate operations when the work is completed, an unacceptable entry condition is detected, or another emergency inside or outside the space is detected. Authorized entrants shall immediately evacuate upon notification of the termination.
- Attendants may monitor multiple sites only if they are able to maintain continuous visual or voice communications with entrants.
 If continuous communications cannot be maintained, additional attendants shall be used.
- Attendants shall perform non-entry rescues in emergencies using rescue equipment staged at the site.
- Upon completion of work and exit of the entrants, the permit shall be canceled by the entry supervisor and forwarded to the ESS. Permits shall be maintained as a part of the project file.



5.2.10 Deviation From Program Requirements

- Any deviation from this procedure requires the approval of the PESM.
- Approval for entry into permit-required confined spaces with air purifying respirators will be given if:
- The composition of the hazardous substance(s) in the confined space is well defined;
- The hazardous substance(s) have good warning properties;
- Short-term exposure to the hazardous substance(s) in excess of the recommended exposure limit will not result in serious physical harm;
- The efficiency of the cartridge versus the hazardous substance(s) is known;
- Forced air ventilation is utilized;
- Reliable monitoring methods are available; and
- Monitoring shows airborne concentrations to be less than the recommended exposure level for the contaminants.



5.2.11 Identification of Confined Spaces

A survey of the sites shall be performed prior to the start of work and documented to identify permit-required confined spaces. All permit-required confined spaces shall be identified with a sign. The sign shall contain the following wording of equivalent:

DANGER - PERMIT REQUIRED CONFINED SPACE

DO NOT ENTER



5.2.12 Program Review

The effectiveness of program implementation shall be reviewed by the PESM during site EHS inspections pursuant to EHS 3-3, Inspections, using the canceled permits and relevant incident information. The program will be modified, as necessary, on the basis of the PESM program reviews.



5.2.13 Training

Authorized entrants, attendants, and entry supervisors shall be trained in accordance with 29 CFR 1910.146 (g) including the following topics as appropriate:

- The contents of this procedure;
- Their respective duties;
- CPR /First Aid (attendants and entry supervisors if they are serving as rescue personnel);
- Hazards commonly found in confined spaces;
- Lockout/tagout procedures;
- Isolation practices;
- · Ventilation of confined spaces;
- Supplied air respiratory protection and SCBAs;
- · Self rescue:
- · Methods of communication;
- · Atmospheric monitoring; and
- Rescues.

Training shall establish employee proficiency in the skills required for confined space entry and the understanding and knowledge for the safe performance of all duties required by this procedure. Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.



6.0 REFERENCES

29 CFR 1910.146, Permit-Required Confined Spaces

29 CFR 1926.502(d), Fall Protection.

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping

Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections

Environmental, Health & Safety - Programs Procedure EHS 4-2, Hazard Communication [J

Environmental, Health & Safety - Programs Procedure EHS 5-1, Personal Protective Equipment 🗓

Environmental, Health & Safety - Programs Procedure EHS 5-2, Respiratory Protection [

Environmental, Health & Safety - Programs Procedure EHS 6-4, Lockout/Tagout 📮

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)



7.0 ATTACHMENTS

Attachment A - Pre-Entry Briefing Checklist Attachment B - Confined Space Entry Permit



PRE-ENTRY BRIEFING CHECKLIST

Click the icon below to launch or download.



EHS 6-1 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

EHS 6-1 ATTACHMENT B
CONFINED SPACE ENTRY PERMIT

Click the icon below to launch or download.



EHS 6-1 Attachment B rev 3.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

Tetra Tech EC, Inc.

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Proprietary Information

EHS 6-1 ATTACHMENT A



CONFINED SPACE ENTRY PRE-ENTRY BRIEFING CHECKLIST

Pro	roject Name: Proj	ect Location:				
Date:		»:				
Con	Completed By:					
Atte	attendee(s):					
	Hazard Communication (including the signs, sympto	ms, and modalities of chemical overexposure.				
	Physical hazards present.					
	All hazard controls.					
	Acceptable entry conditions.					
	Emergency procedures.					
	Rescue procedures.					
	Duties of entrants and attendants during routine and	emergency operations.				
	Frequency and Types of Monitoring.					
	Communications sytem backup to be used.					
	Review of work to be accomplished during entry.					
	Decontamination procedures (if necessary).					
	PPE disposal					
	Potential emergencies that may occur outside the co	nfined space.				

PRELIMINARY EHS 6-1 ATTACHMENT B



CONFINED SPACE ENTRY PERMIT

	ALID FOR ONE SHIP	TONLY. ALL PER	WIII COPI	ES REMAIN AT SITE UNTIL JO	OB COMPLETED.
DATE:	SITE LOCATION	N/DESCRIPTION:			
PURPOSE OF ENTRY:					
SUPERVISOR(S) IN CHARG	E OF CREWS/TYPE O	F CREW/PHONE #:			
COMMUNICATION PROCE	DURES:				
RESCUE PROCEDURES AN	D PHONE NUMBERS:				
Name of Emergency Service	(ES) Phone# of ES	Date/Time ES contacted	ES Available ? Y or N	Date/Time ES Response Made Before Confined Space After Confined Space	Comments/Problems with Service
REQUIREMENTS COMPLET Breathing Apparatus Emergency Escape/Fall Retriev Equipm Fire Extinguishers Full Body Harness w/ "D" Rin Lifelines Lighting (Explosive Proof)	val	TIME	_ Line _ Prot _ Purg _ Resp _ Secu _ Stan	oiratory Protection	TE TIME
Note: For items that do not apply, ϵ .	enter N/A in the blank. See I	page 2 to add any special	requirements.		
		CORD MONITORIN	G RESULT	TS EVERY 1/4 HOUR	
TEST(S) TO BE TAKEN PERCENT OF OXYGEN	Permissible Entry Level 19.5% to 22.0%			Time(s)	_
LOWER FLAMMABLE LIMI	IT Under 10 % _				_
					-

Revision Date 02/06/07

EHS 6-1 ATTACHMENT B CONFINED SPACE ENTRY PERMIT

GAS TESTER NAME & CHECK #	INSTRUMENT(S) USED	MODEL &/OR TYPE	SERIAL &/OR UNIT#
SUPERVISOR AUTHORIZATION—	ALL CONDITIONS SATISFIED:	DEPT/PHONE	3
PRINT NAME:	SIGNATURE:	FUNCTION (i	.e., entrant, attendant, or supervisor)
SPECIAL REQUIREMENTS:			
_			
COMMENTS:			

Revision Date 02/06/07 2

EHS 6-3: Excavation and Trenching

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 05/14/2001

This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P -Purpose:

Excavations.

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1.0 PURPOSE

This program provides the requirements for activities involving excavations in accordance with 29 CFR 1926, Subpart P -Excavations.



2.0 SCOPE

These requirements are applicable to all Tetra Tech EC, Inc. (TtEC) operations.



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Benching

A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.



4.2 Competent Person

A competent person is one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.



4.3 Excavation

Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.



4.4 Hazardous Atmosphere

An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.



4.5 Protective Systems

A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.



4.6 Sloping

A method of protecting employees from cave-ins by forming sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.



4.7 Support System

A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.



4.8 Trench

A narrow excavation made below the surface of the ground. In general the depth is greater than the width, but the width of a trench measured at the bottom is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Competent Person

The competent person(s) shall be responsible for:

- Day-to-day oversight of open excavations and trenches
- Conducting soil classifications
- · Selection of protective systems
- · Conducting daily inspections of open excavations and trenches; and
- Providing the Environmental and Safety Supervisor (ESS) with all required documentation on a daily basis.



5.1.2 Line Management

The Project Manager (PM) shall be responsible for:

- Ensuring compliance with this procedure
- Providing the necessary resources for compliance with this procedure; and
- Designating competent personnel in consultation with the Project Environmental, Health and Safety Manager (PESM)



5.1.3 Environmental, Health and Safety Personnel

The ESS shall be responsible for:

- Providing oversight on the implementation of the requirements contained in this procedure
- Conducting periodic reviews of open trenches and excavations
- Consulting with the project manager and competent person on excavation issues; and
- Maintaining required records.



5.2 Designation of Competent Personnel

Prior to the start of any excavation work the project manager shall designate a competent person to fulfill the requirements of this procedure.



5.3 General Requirements

The following section provides general requirements governing activities in and around excavation and trenches, as well as the requirements for the selection and use of protective systems.

- Surfaces surrounding open trenches and excavations shall have all surface hazards removed.
- All utilities shall be located and cleared prior to initiating digging. Public or facility utility groups shall be utilized where possible for this purpose. In the absence of either, the ESS shall specify the procedures to be used to clear utilities in consultation with the project PESM and project manager. When the excavation is open, utilities shall be supported and protected from damage. Clearance and support methods shall be documented on the daily inspection checklist.
- Where structural ramps are used for egress they shall be installed in accordance with 29 CFR 1926.651(c)(1).
- Stairways, ladders, or ramps shall be provided as means of egress in all trenches 4 feet or more in depth. Travel distance shall be no more than 25 feet between means of exit.
- Employees exposed to vehicular traffic shall wear traffic vests.
- No employee shall be permitted under loads being lifted or under loads being unloaded from vehicles.
- When vehicles and machinery are operating adjacent to excavations warning systems such as stop logs or barricades shall be utilized to prevent vehicles from entering the excavation or trench.
- Scaling or barricades shall be used to prevent rock and soils from falling on employees.
- Excavated and loose materials should be kept at least 3 feet from the edge of excavations, but at a minimum of 2 feet from the edge of the excavation in accordance with OSHA requirements.
- Walkways or bridges with standard railing shall be provided at points employees are to cross over excavations or trenches.
- Barriers shall be provided to prevent personnel from inadvertently falling into an excavation.



5.4 Hazardous Atmospheres

Where atmospheres containing less than 19.5 percent oxygen or other types of hazardous atmospheres may exist the following requirements shall be implemented.

- Atmospheric testing shall be done prior to employees entering excavations 4 feet or greater in depth.
- Testing methods shall be listed on the daily inspection checklist and results documented daily in field logs.
- Control measures such as ventilation and personal protective equipment (PPE) shall be used to control employee exposure to hazardous atmospheres below published exposure limits.
- Ventilation shall be used to control flammable and combustible vapors to below 10 percent of their lower explosive limit.
- Testing shall be repeated as often as necessary to ensure safe levels of airborne contaminants.
- Emergency equipment shall be provided and attended when the potential for a hazardous atmosphere exists. This equipment shall include but not be limited to emergency breathing apparatus, harnesses, lifelines, and basket stretchers. Required equipment will be listed on the daily inspection checklist and reviewed daily.



5.5 Protection From Water Hazards

When water has collected or is collected in excavations and trenches the following requirements shall be applied.

- Employees shall not work in excavations in which water has, or is, accumulating without the use of additional protection such as special support systems or water removal.
- Water removal shall be monitored by a competent person.
- Barriers such as ditches and dikes shall be used to divert runoff from excavations and trenches.
- Trenches shall be reinspected prior to re-entry after water accumulation due to heavy rainfall or seepage.

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5.6 Stability of Adjacent Structures

When excavating or trenching near an adjacent structure the following practices shall be implemented.

- Support systems such as shoring, bracing, or underpinning shall be provided where the stability of buildings, walls, or other structures is endangered by excavation.
- Excavation bases or footings of foundations shall be prohibited unless support systems are used, the excavation is in stable rock, a professional engineer has determined the structure is sufficiently removed from the site as to not pose a hazard, or the PE determines that the excavation shall not pose a hazard to employees due to the structure.
- Support systems shall be used when it is necessary to undermine sidewalks, pavements, and appurtenant structures.
- Surcharge load sources and adjacent encumbrances shall be listed with their evaluation date on the daily inspection checklist.



5.7 Daily Inspections

Inspections shall be performed daily on all excavations, adjacent areas, and protective systems before personnel enter the trench. The checklist provided in Attachment A or equivalent shall be used.



5.8 Soil Classification

To perform soil classification, the competent person shall use a thumb test, pocket penetrometer, or shear vane to determine the unconfined compressive strength of the soils being excavated. In soils with properties that change (i.e., one soil type mixed with another within a given area) several tests may be necessary. When different soil types are present the overall classification shall be that of the type with the lowest unconfined compressive strength. Classifications shall result in a soil rating of Stable Rock, Type A, Type B, or Type C in accordance with 29 CFR 1926.652, Appendix A. Soil classifications shall be listed on the daily inspection checklist. The soils analysis checklist provided in Attachment B or equivalent shall be used for soil classifications.



5.9 Sloping and Benching

All sloping and benching shall be done in accordance with 29 CFR 1926.652, Appendix B. Selection of the sloping method and evaluation of surface surcharge loads shall be made by a competent person familiar with the requirements contained therein. Sloping and benching methods and specifications shall be listed on the daily inspection checklist.



5.10 Protective Systems

Protective systems are required on all excavations over 5 feet in depth or in excavations less than 5 feet when examination of the ground by a competent person reveals conditions that may result in cave-ins.

Selection and installation of protective systems shall be done in accordance with 29 CFR 1926.652, Appendices C & D, or manufacturers data for shoring and shielding systems. Selection of a protective system shall be made based upon soil classification and job requirements by a competent person. Protective systems and specifications shall be listed on the daily inspection checklist.



5.11 Training

Competent persons shall have an adequate combination of experience and training to classify soil types and select protective systems as outlined in 29 CFR 1926.652. Training and experience pertaining to qualification as a competent person shall be documented and include the following:

- General safety practices related to working in or near open excavations;
- · Inspection requirements and techniques;
- Classification of soils in accordance with 29 CFR 1926.652, Appendix A; and
- Uses, limitations, and specifications of protective systems in accordance with 29 CFR 1926.652.

Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.



6.0 REFERENCES

29 CFR 1926, Subpart P, Excavations.

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping COSHA (U.S. Department of Labor, Occupational Safety and Health Administration),



7.0 ATTACHMENTS

Attachment A - Daily Excavation Inspection Checklist Attachment B - Soils Analysis Checklist



EHS 6-3 ATTACHMENT A DAILY EXCAVATION INSPECTION CHECKLIST

Click the icon below to launch or download.



EHS 6-3 Attachment A 04-03-03.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.



EHS 6-3 ATTACHMENT B SOILS ANALYSIS CHECKLIST

Click the icon below to launch or download.



EHS 6-3 Attachment B.doc

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EHS 6-3 ATTACHMENT A



DAILY EXCAVATION INSPECTION CHECKLIST

To be completed by a "Competent Person"

Site	locati	on			
Date	·	Time Competent Person			
Soil	Туре	(s)			
	Soi	l Classification(s) Excavation depth	Excavation width		
Тур	e of p	rotective system used	_		
					_
Indi	cate f	or each item by circling: Y (Yes), N (No), - Address in Comments, Not Applicat	ble (N/A.)		
I.	Gen	eral Inspection of Job Site			
	A.	Surface encumbrances removed or supported	Y	N	N/A
	В.	Employees protected from loose rock or soil that could pose a			
		hazard by falling or rolling into the excavation	Y	N	N/A
	C.	Hard hats worn by all employees	Y	N	N/A
	D.	Spoils, materials, and equipment set back at least 2 feet from the edge			
	_	of the excavation	Y	N	N/A
	E.	Barriers provided at all remotely located excavations, wells, pits, shafts, etc.	Y	N	N/A
	F.	Walkways and bridges over excavations 4 feet or more in depth are	3.7	N T	N T/A
	C	equipped with standard guardrails	Y	N	N/A
	G.	Warning vests or other highly visible clothing provided and worn	V	NI	NT/A
	TT	by all employees exposed to public vehicular traffic	Y	N	N/A
	H.	Warning system established and utilized when mobile equipment is	Y	NI	N/A
	I.	operated near the edge of the excavation Employees prohibited from working on the faces of sloped or	ĭ	N	IN/A
	1.	benched excavations above other employees	Y	N	N/A
		benched excavations above other employees	I	11	IN/A
II.	Util	ities			
		Utility companies contacted and/or utilities located	Y	N	N/A
		Exact location of utilities marked when approaching the utilities	Y	N	N/A
		Underground installations protected, supported or removed when excavation			
		is open	Y	N	N/A
III.	Mea	ans of Access and Egress			
	A.	Lateral travel to means of egress no greater than 25 feet in			
		excavations 4 feet or more in depth	Y	N	N/A
	B.	Ladders used in excavations secured and extended 3 feet above			
		the edge of the trench	Y	N	N/A
	C.	Structural ramps used by employees designed by a competent person	Y	N	N/A
	D.	Structural ramps used for equipment designed by a registered			
		professional engineer (RPE)	Y	N	N/A
	E.	Ramps constructed of materials of uniform thickness, cleated together on			
		the bottom, equipped with a no-slip surface	Y	N	N/A
	F.	Employees protected from cave-ins when entering or exiting the excavation	Y	N	N/A

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EHS 6-3 ATTACHMENT A DAILY EXCAVATION INSPECTION CHECKLIST

IV.	Wet	t Conditions			
-	A.	Precautions taken to protect employees from the accumulation of water	Y	N	N/A
	B.	Water removal equipment monitored by a competent person	Y	N	N/A
	C.	Surface water or runoff diverted or controlled to prevent accumulation			
		in the excavation	Y	N	N/A
	D.	Inspections made after every rainstorm or other hazard increasing occurrence	Y	N	N/A
v.	Haz	cardous Atmospheres			
	A.	Atmosphere within the excavation tested where there is a reasonable			
		possibility of an oxygen deficiency, combustible or other harmful			
		contaminant exposing employees to a hazard	Y	N	N/A
	B.	Ventilation	Y	N	N/A
	C.	Testing conducted often to ensure that the atmosphere remains safe	Y	N	N/A
	D.	Emergency equipment, such as breathing apparatus, safety harness and			
		line, and basket stretcher readily available where hazardous atmospheres			
		could or do exist	Y	N	N/A
	E.	Safety harness and life line used and individually attended when entering			
	_,	deep confined excavations	Y	N	N/A
			-	- 1	1,712
VI.	Sup A.	port Systems Materials and/or equipment for support systems selected based on soil			
	A.		Y	NI	N/A
	D	analysis, trench depth and expected loads	Y	N	N/A
	В.	Materials and equipment used for protective systems inspected and in	17	NI	NT/A
	0	good condition	Y	N	N/A
	C.	Materials and equipment not in good condition have been removed	3.7	3.7	3.7/4
	ъ	from service	Y	N	N/A
	D.	Damaged materials and equipment used for protective systems inspected		3.7	3.7/1
	_	by a RPE after repairs and before being placed back into service	Y	N	N/A
	E.	Protective systems installed without exposing employees to the hazards			
		of cave-ins, collapses or from being struck by materials or equipment	Y	N	N/A
	F.	Members of support system securely fastened to prevent failure	Y	N	N/A
	G.	Support systems provided to insure stability of adjacent structures,			
		buildings, roadways, sidewalks, walls, etc.	Y	N	N/A
	Н.	Excavations below the level of the base or footing approved by an RPE	Y	N	N/A
	I.	Removal of support systems progresses from the bottom and members are			
		released slowly as to note any indication of possible failure	Y	N	N/A
	J.	Backfilling progresses with removal of support system	Y	N	N/A
	K.	Excavation of material to a level no greater than 2 feet below the bottom of			
		the support system and only if the system is designed to support the loads			
		calculated for the full depth	Y	N	N/A
	L.	Shield system placed to prevent lateral movement	Y	N	N/A
	M.	Employees are prohibited from remaining in shield system during			
		vertical movement	Y	N	N/A
		, , , , , , , , , , , , , , , , , , , ,			
VII.	Cor	nments			

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EHS 6-3 ATTACHMENT B



the excavation (trench) is stre				analysis must also be performe
Site location:				
Date: T	ime:	Com	petent Person	
Where was the sample taken f	rom?			
			Length:	
VISUAL TEST				
Particle type:	_ Fine Grain	ed (cohesive)	Course grained (sand	d or gravel)
Water conditions: Wet	[Dry	Surface water present	Submerged
Previously disturbed soils?	_ Yes	No		
Underground utilities?	_ Yes	No		
Layered soils?	_ Yes	No		
Layered soil dipping into excavation?	_ Yes	No		
Excavation exposed to vibrations:	_ Yes	No		
Crack-like openings or spallings observed?	_ Yes	No		
Conditions that may create a hazardous atmosphere?	_ Yes	No		
If yes, identify condition and	source: _			
Surface encumbrances:	Yes	No		
Work to be performed near public vehicular traffic?	_ Yes	No		
Possible confined space exposure?	_ Yes	No		
MANUAL TEST				
Plasticity:	_ Cohesive	Non-co	phesive	
Dry Strength:	Granular (crumbles easily	Cohesive (broken w	rith difficulty)

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EHS 6-3 ATTACHMENT B SOILS ANALYSIS CHECKLIST

NOTE: The following unconfined compressive strength tests should be performed on undisturbed soils. **THUMB TEST** (used to estimate unconfined compressive strength of cohesive soil) Test performed: Yes No Type A (soil indented by thumb with very great effort) Type B (soil indented by thumb with some effort) Type C (soil easily penetrated several inches by thumb with little or no effort). If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting. **PENETROMETER OR SHEARVANE** (used to estimate unconfined compressive strength of cohesive soils) Test performed: Yes Type A (soil with unconfined compressive strength of 1.5 tsf or greater) Type B (soil with unconfined compressive strength of 0.5 tsf to 1.5 tsf) Type C (soil with unconfined compressive strength of 1.5 tsf or less). If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting. WET SHAKING TEST (used to determined percentage of granular and cohesive materials). Compare results to soil textural classification chart to determine soil type. Test performed Yes No Type A (clay, silty clay, sandy clay, clay loam, and in some cases silty clay, loam and sandy clay loam) Type B [angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and in some cases, silty clay loam and sandy clay loam Type C(granular soil including gravel, sand and loamy sand) % granular % cohesive % silt NOTE: Type A -- no soil is Type "A" if soil is fissured; subject to vibration; previously disturbed; layered dipping into the excavation on a slope of 4H:1V. SOIL CLASSIFICATION Type A ____ Type B ____ Type C SELECTION OF PROTECTIVE SYSTEM Sloping, Specify angle: ____ Timber Shoring ____ Aluminum Hydraulic Shoring NOTE: Although OSHA will accept the above tests in most cases, some states will not. Check your state

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safety requirements for trenching regulations.

EHS 6-4: Lockout/Tagout

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 12/28/1999

The purpose of this program is to establish the minimum requirements and procedures for performing lockout/tagout on Purpose:

Document Owner:

machines and equipment in accordance with 29 CFR 1910.147, Control of Hazardous Energy (Lockout/Tagout).

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1.0 PURPOSE

The purpose of this program is to establish the minimum requirements and procedures for performing lockout/tagout on machines and equipment in accordance with 29 CFR 1910.147, Control of Hazardous Energy (Lockout/Tagout).



2.0 SCOPE

This program applies to all Tetra Tech EC, Inc. (TtEC) operations, except as follows:

- Work on cord and plug connected electrical equipment where the plug is under the control of the employee performing the work:
- · Hot tap operations; and
- Work involving minor changes and adjustments to equipment during routine operations (such as small tooling adjustments).



3.0 MAINTENANCE

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.



4.0 DEFINITIONS



4.1 Affected Employee

An employee whose job requires them to operate or use a machine or equipment on which servicing, maintenance, or other work is performed under lockout/tagout or whose job requires them to work in an area in which equipment is locked out.



4.2 Authorized Employee

A person who locks out or implements a lockout/tagout system procedure on machines or equipment. Authorized and affected employees may be the same person when the authorized employee's duties also include performing work on a machine or equipment upon which lockout/tagout is implemented.



4.3 Energized

Connected to an energy source or containing residual or stored energy.



4.4 Energy Isolating Device

(Isolation Points) - A mechanical device that may be used to physically prevent the transmission, flow, or release of energy, including but not limited to the following:

- · electrical circuit breakers;
- slide gate;
- disconnect switches;
- · piping flanges;
- control switches; and
- · other similar devices.



4.5 Energy Source

Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, potential, or other energy.



4.6 Lockout

The placement of a lockout device and tag on a lockout device ensuring that the energy isolation device and equipment cannot be operated until the device is removed.



4.7 Lockout Device

A device that physically controls the configuration of an energy isolation point. Lockout devices include but are not limited to the following:

- locks
- chains
- · valve covers
- circuit breaker hasps
- · blind flanges
- · slip blinds, and
- multiple lock hasps



4.8 Supervisor Lock

A lock installed by an authorized supervisor for the purpose of maintaining control of a machine or piece of equipment for a period greater than one work shift.



5.0 DISCUSSION



5.1 Responsibilities



5.1.1 Authorized Employees

Authorized employees shall lockout and tag all energy isolation devices which are required to be locked out by this procedure. The employee shall complete all permits and tags in accordance with instructions and shall remove their locks and tags and return them at the end of their shift or the end of the procedure.



5.1.2 Line Management

Supervisors shall ensure proper implementation of the lockout/tagout procedure including approval of permits and maintenance of personal locks and a log of lock assignments. In group lockout procedures the supervisor shall lock and tag all the appropriate energy isolation devices and deposit his/ her key in the lockbox.



5.1.3 Environmental, Health and Safety Personnel

The Environmental and Safety Supervisor (ESS) is responsible for providing the training required in this procedure to supervisors and craft employees, and conducting periodic inspections to ensure this procedure is effectively implemented. The ESS shall also implement lockout/tagout procedures as required.



5.2 General Requirements

Following are the steps to be followed in preparing for, applying, and releasing a machine or piece of equipment from lockout. These steps shall be completed, in order, using the corresponding permit included as Attachment A. While work is being performed under the lockout, a copy of the completed permit shall be posted at the equipment controls or work area as appropriate.

1. Complete the general information in Section A of the permit

2. Identify Isolation Points

The first step required to isolate a piece of equipment is to identify the sources of hazardous energy present. To identify the sources, the authorized employee shall complete the following steps:

- Survey the equipment and related schematics, blueprints, or as-builts, if available, for hazardous energy sources;
- Identify the isolation points and device positions for controlling each source of hazardous energy; and
- Identify the isolation method to be used on each source.

The above information shall be documented in Section B of the Lockout/Tagout Permit as each point is identified.

3. Notifications

Prior to applying a lockout, the authorized employee shall notify affected employees of the equipment to be locked out and sign Section C of the Lockout/Tagout Permit on the "Notifier" line.

4. Equipment Shutdown

Shut down the equipment or place into the desired configuration using normal operating procedures. The authorized employee shall sign Section C of the Lockout/Tagout Permit on the "Shutdown by" line.

5. Equipment Isolation

To apply a lockout to a piece of equipment, complete the following steps:

- Place each energy isolation device into a position that will prevent the transmission of hazardous energy; and
- The authorized employee shall lockout devices to each isolation point and control the key for each lock at all times. Only one key is permitted per lock.

Complete Section D of the permit as each device is placed and sign the "Isolator" line in Section C.

Notes:

- Any lockout device not containing an integral locking mechanism must be used in conjunction with a keyed lock.
- Any energy isolation point not capable of being locked out must be controlled physically through such means as removal of handles and disconnecting.

6. Release of Stored Energy

After the equipment has been locked and tagged as required in Section D all remaining stored energy must be released. Methods for the release of stored energy include, but are not limited to the following:

- · Discharge and grounding of capacitors,
- Bleeding pressure from vessels and lines, and
- Releasing mechanical sources of energy to engage blocks.

If stored energy has the potential to re-accumulate; therefore, verification of isolation shall continue until work is complete. After releasing stored energy complete Section E of the permit.

7. Lockout/Tagout Verification

After completing the lockout of the desired piece of equipment the effectiveness of the lockout must be verified by the authorized employee by attempting to operate the machine. After attempting to operate the machine, sign Section C of the permit on the "Verifier" line.

8. Performance of Work

After verifying and receiving the supervisor's approval signature, work may be performed on the equipment which was locked/tagged.

9. Lockout/Tagout Removal

After work has been completed the following steps shall be followed to release equipment from lockout tagout:

- The area affected by the lockout shall be inspected to ensure that releasing the machine does not present a hazard to people and property,
- · Lockout devices and tags shall be removed,
- Isolation devices returned to their operating positions,
- The equipment started, and
- Affected employees shall be notified of the release.

Section F of the permit shall be completed as the equipment is returned to service.



5.3 Testing/Positioning

When necessary to interrupt lockout/tagout for testing or repositioning, the steps contained in Section 5.2 shall be followed.



5.4 Group Lockouts

When multiple people are scheduled to work on a system, the following group lockout procedure should be implemented as follows:

- The Site Supervisor shall place their lock on the energy isolation device(s) using a multilock hasp.
- Authorized employees shall place their individual locks on the multilock hasp.
- When the group has completed their work, the supervisor shall verify all employee locks have been removed before the supervisor removes his/her lock.



5.5 Tagout

The use of tags without locks is prohibited, except in those cases where it is physically impossible to attach a locking device to an isolation point. When it is necessary to use tags without locks the following shall be completed.

- The isolation point shall be placed in the correct position to prevent the flow of energy;
- The device shall be physically disconnected;
- A tag shall be placed on the disconnected device; and
- Employees shall be warned not to tamper with the tag or isolation point.



5.6 Equipment-Specific Lockout/Tagout Procedures

As TtEC does not normally perform lockouts of machinery on a repetitive basis the LO/TO permit contained in Attachment A is designed for initial and one-of-a-kind lockouts. Should it become necessary to repetitively lockout the same piece of equipment, specific procedures and permits for the equipment shall be developed.

Information contained in the equipment-specific procedure and permit should be the same as the information in the Attachment A permit. The procedures shall be generated by trained and knowledgeable project personnel and be reviewed and approved by the Project Environmental and Safety Manager (PESM).

Equipment-specific procedures are not required when all of the following conditions are present:

- The machine has no potential for stored energy or the reaccumulation of energy after shutdown; and
- The equipment has a single, readily identifiable, and isolated source of energy; and
- Isolation and lockout of the source will completely deenergize and deactivate the equipment; and

- The machine is locked out and isolated from that energy source during servicing and maintenance; and
- A single lockout device will achieve a locked-out condition; and
- The servicing or maintenance does not create a hazard to other employees.



5.7 Shift Changes

When necessary to maintain the status of a locked out machine or device past the end of the shift when the lockout was initially installed the following procedures shall be adhered to:

- The incoming authorized employee shall place their lock hasp on the lockout point and complete a new permit.
- The outgoing employees shall remove their lock(s) after the new lock(s) are applied.
- If multiple shifts are not used, the initial locks may be left in place until the following day or until the equipment is released from lockout/tagout.
- The new shift supervisor shall sign the permit before work is begun on the new shift. The last supervisor whose name is on the lockout/tagout tags permit is responsible for all activities related to the work activity.



5.8 Failure to Clear Locks

If a person should fail to clear a lockout and their lock remains in place, the supervisor will attempt to contact the person who applied the lock and resolve the issue.

If the person cannot be contacted, the supervisor will investigate the situation and determine that removal of the lock will not create a hazard in the work zone. The supervisor will then verify that the work zone is clear, and blocking devices have been removed and the system has been restored to the normal configuration. The supervisor will then cut the lock off and restore energy to the system.

A written incident and investigation report per EHS 1-7, Incident Reporting and Investigating, shall be prepared by the supervisor stating the reason for cutting the lock, why the lock was not removed, and the procedure used to ensure the safety of personnel in the area. The individual whose lock was cut off must be notified ASAP.



5.9 Subcontractors

The supervisor shall be familiar with the nature of any subcontractor work on-site that may involve hazardous energy and assure that they follow work practices that are at least as strict as this procedure.

For any lockout/tagout requirements, the supervisor shall review and approve all subcontractor work set up, apply his locks to the scheme, and sign the appropriate lockout/tagout procedure checklist.



5.10 Periodic Inspections

Periodic inspections pursuant to EHS 3-3, Inspections, shall be completed during the monthly inspections by the ESS, PESM or other qualified personnel to ensure that the lockout tagout program is being effectively implemented. As a minimum the following shall be done:

- Existing lockouts will be reviewed for effectiveness;
- Permits for each existing lockouts shall be reviewed for adequacy;
- Incident reports and past permits shall be reviewed to determine if deficiencies in the program exist;
- Corrections to the system will be made as warranted; and
- Results will be logged in the health and safety logbook.



5.11 Training

Following are the training requirements for various personnel involved with or affected by lockout/tagout.

- Authorized Employees shall receive training in the following prior to being allowed to use lockout/tagout procedures:
- Recognition of hazardous energy sources;
- Types and magnitudes of energies available at the site;
- Methods and means needed for energy isolation and control; and
- The requirements of this procedure and 29 CFR 1910.147.
- Affected Employees shall be instructed in the following:
- Purpose of the lockout tagout program;
- Use and requirements of this procedure and 29 CFR 1910.147;
- Prohibitions of restarting or tampering with equipment that has been locked out; and
- Prohibitions of tampering with locks and tags installed on equipment.

Personnel not employed by TtEC shall be briefed in the requirements of this program during site-specific orientations, when applicable.

Training records shall be maintained in accordance with EHS1-9, Recordkeeping.



6.0 REFERENCES

29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout).

Environmental, Health & Safety - Programs Procedure EHS 1-7, Incident Reporting and Investigation 🚨

Environmental, Health & Safety - Programs Procedure EHS 1-9, Recordkeeping 🗓

Environmental, Health & Safety - Programs Procedure EHS 3-3, Inspections 🗓

OSHA (U.S. Department of Labor, Occupational Safety and Health Administration)



7.0 ATTACHMENTS

Attachment A - Lockout Tagout Permit



EHS 6-4 ATTACHMENT A LOCKOUT TAGOUT PERMIT

Click the icon below to download and complete.



EHS 6-4 Attachment A.doc

Select the "Detach" button in the pop-up window to save a copy to a disk or hard drive.

Tetra Tech EC, Inc.

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EHS 6-4 ATTACHMENT A



LOCKOUT/TAGOUT PERMIT

Project Name: Location					:				
		SEC	CTION A				S	SECTION C	
DATE:SHIFT:				REQUESTOR:					
EQUIPMENT	DESCRIPT	ION:					NOTIFIER:		
EQUIPMENT	LOCATION	N:					SHUT DOW	N BY:	
REASON FOR							ISOLATOR:	ISOLATOR:	
SUPERVISOR	R ON DUTY	:					VERIFIER:_		
AUTHORIZEI							APPROVED BY:		
LOCKOUT LO	OCATIONS	:							
SE ISOLATION	CTION B N INFORM	MATION	EQU	SECTI IPMENT		TION	LOCK	ECTION F OUT/TAG EMOVAL	OUT
Device		Isolation	Applied	Lock			Removed		
Description	Location	Position	By	#	Date	Time	By	Date	Time
SPECI	AL INST	RUCTIO	NS FOR F	REMOV	AL OR 1	RELEAS	SING STOR	ED ENER	RGY

EHS 6-5: Welding/Hot Work

Last Revision By: Andrew Hopper on 02/13/2012 Created By: Lisa Kaminski on 01/06/2009

Purpose: The purpose of this program is to establish a method to protect personnel from injury (e.g. burns, shocks, asphyxiation) and

to prevent fires as a result of welding and hot work.

Version Date:

01/06/2009 - New

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EHS Compliance/Waste Management, Field

Activities/Science, Operational

Control, Training, Communication

Document Owner: Skip Parry

Approved By:



1.0 PURPOSE

2.0 SCOPE

3.0 MINIMUM REQUIREMENTS

4.0 GUIDANCE

5.0 REFERENCES

6.0 ATTACHMENTS



1.0 PURPOSE

The purpose of this procedure is to establish a method to protect personnel from injury (e.g. burns, shocks, asphyxiation) and to prevent fires as a result of welding and hot work.



2.0 SCOPE

This document applies to all welding, cutting, grinding or other spark-producing or open flame activities on Tetra Tech EC, Inc. (TtEC) project sites, including but not limited to brazing, cutting, welding, grinding, soldering, pipe thawing, and thermite welding (cadwelds).



3.0 MINIMUM REQUIREMENTS

3.1 Responsibilities

3.1.1 Environmental, Health and Safety Personnel

The Director, Environmental, Safety and Quality (ESQ) Programs is responsible for this procedure.

The Environmental and Safety Supervisor (ESS) is responsible for providing oversight of hot work and welding activities.

The Project Environmental Safety Manager (PESM) is responsible for providing consultation to the Project, including appropriate protective equipment and worker monitoring.

3.1.2 Permit Authorizing Individual (PAI)

The PAI is designated by in writing by management. The PAI(s) will have the experience and training to understand the risks and mitigation methods of hot work.

For Task Specific areas, the PAI:

- Inspects for flammable materials, hazardous processes and other fire hazards that are, or likely to be present in the work location.
- Ensures the protection of combustibles from ignition by moving the work to a location that is free from combustibles, moving the combustibles away, or covering combustibles with a fire resistant covering.
- Verifies that fire protection and extinguishing equipment are available at the hot work site.
- Determines when Fire Watches are required and verifies that a fire watch is at the Task Specific site.
- Identifies the PPE that is required for the Hot Work Operator (consults with the ESS and PESM as necessary).
- Completes and issues the Hot Work Permits for work in Task-Specific Areas (Attachment A).

(Note: Task-Specific Hot Work Area is for hot work that is performed outside of a Designated Area and for a specific task that is made fire safe by removing or protecting combustibles from ignition sources. Hot Work Permits are required for Task Specific hot work and are valid for one shift only. Fire watches are typically required).

For Designated Areas, the PAI:

- Provides regular inspection of Designated Areas
- Verifies that unnecessary combustible, flammable materials have not been brought into the Designated Areas (Attachment B - Hot Work Precautions Checklist may be used).

(Note: A Designated (Hot Work) Area is a permanent, specific location designed or approved for hot work operations to be performed regularly (e.g., a maintenance shop or a detached defined outside location that is of noncombustible or fire-resistant construction), that is essentially free of combustible and flammable contents, and is suitably separated from adjacent areas. The Designated Area must be maintained free of combustibles as this area allows hot work at any time. A fire watch or a hot work permit is not typically required. The PAI is responsible for daily inspections when the area is in use).

3.1.3 Hot Work Operator

Hot Work Operators are responsible for:

- The safe operation of equipment in accordance with the manufacturer's instructions.
- Wear/use the proper PPE.
- Awareness of the hazards of hot work and emergency procedures in the event of a fire.
- Having the PAI approval before starting hot work operations.
- Ceasing work if unsafe conditions develop and notifying the PAI.

3.1.4 Fire Watch

Individuals assigned to observe and protect the Hot Work Operator and property. The Fire Watch is responsible for:

- Fire safe actions have been completed in the area prior to the start of hot work (combustibles/flammables removed, openings in wall/floor covered, areas below are free of combustible materials). 10 ABC or larger fire extinguisher immediately available and maintained throughout the performance of work.
- Suspending the work if unsafe conditions develop.
- Quenching or Extinguishing incipient fires and summoning assistance in case of fire

3.2 Hot Work Operations

3.2.1 Hot Work and Flame/Spark Producing Equipment

The PAI shall examine the Task Specific Area where the work is to be performed and shall ensure that:

- Sprinkles, if provided, are in service and will not be taken out of service until this work has been completed.
- Within 35 feet of the hot work
 - O Combustible lint, dust, vapors, liquids, or unpurged tanks or equipment previously containing such materials are removed or protected with fire resistant covers.
 - O All floor and wall openings within 35 feet of the hot work will be tightly covered or protected with fire-resistant covers (Note: Some processes such as air carbon arc cutting and plasma cutting may cause sparks to travel in excess of 35 feet requiring the area to be expanded).
- The work will be confined to the area or equipment specified in the permit.
- Floors and surroundings have been swept clean, with combustible floors and construction formwork (if any) dampened.
- A suitable fire extinguisher is available at the hot work site. (an additional water bucket, sprayer, or damp sand may be
 used for quenching, cooling or covering hot slag or smoldering material)/
- Proper personal protective equipment (PPE) is identified in the hot work permit and is being worn by persons performing
 or observing the work.
- One or more fire watch persons have been assigned to watch for sparks in the area, as well as on floors above and below, and the fire watch stays in the area for a minimum of 30 minutes after the end of the hot work activity.
- Arrangements have been made for a patrol of the area, including floors above and below, during any lunch or rest period.
 Task Specific Hot work permits are good for one shift only.
- All containers (drums, tanks, piping) are considered unsafe for welding, cutting or heating until it has been made safe, or

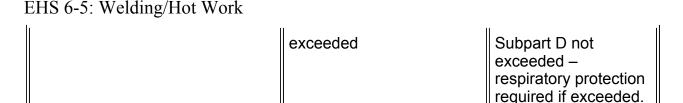
- declared safe by a qualified person.
- The Hot Work Permit included as Attachment A or an equivalent form has been completed.

3.2.2 Ventilation, Gases & Vapors

The PAI will consult with the ESS and PESM to determine the appropriate PPE and the need for monitoring the area and worker (s) when certain metals or other significant toxics are known or suspected. Table 3.2.2-1 identifies the ventilation and respiratory protection that are required. When respiratory protection is to be used, the PESM will assist in the selection of the equipment and ensuring that the elements of a respiratory protection program are in place. Refer to EHS 5-2 and the project planning documents (Health and Safety Plan, IH Monitoring Plan or AHA).

Table 3.2.2-1 Work Categories and Ventilation/Respiratory Protection (OSHA-based)

Hot Work Type	Type of Ventilation or Respiratory Protection Required*	Comments & Notes
In Any Enclosed Space - Zinc-Bearing, Chrome-bearing base or filler metals, or materials coated with chrome bearing materials - Lead based materials, - Cadmium bearing filler materials or cadmium coated materials - Zinc-bearing base or filler metals or coatings - Mercury bearing coatings	General Ventilation and Local exhaust required, sampling demonstrates otherwise OR workers protected by supplied air respirators	
<u>Confined Spaces</u> - Any hot work	General Ventilation required.	Respiratory Protection (supplied air) required when safe limits are not achieved. PESM involvement required
In Any Location Beryllium Containing base or filler metals	General Ventilation and local exhaust required and workers protected by supplied air respirators.	
In Any Location GMAC welding on Stainless Steels	Local Exhaust OR supplied air respirators	
Open Areas (outside) Involving - Zinc-Bearing, Chrome-bearing base or filler metals, or materials coated with chrome bearing materials - Lead based materials, - Cadmium bearing filler materials or cadmium coated materials - Zinc-bearing base or filler metals or coatings - Mercury bearing coatings	Workers protected by filter type respirators	
General Welding, Cutting & Heating (not involving metals shown above)	Ventilation not required unless 29 CFR 1926, Subpart D limits are	Sampling may be required to verify TLV in 29 CFR 1926,



* Any other employees exposed to the same atmosphere will be protected in the same manner as the welder or cutter.

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The hot work on surfaces with protective coatings will be evaluated for flammability and if flammable, stripped or removed at least 4 inches from the area of heat application, or the employees involved in the hot work area will be protected by a respirator.

3.2.3 Personal Protective Equipment

Workers and observers in hot work areas will have eye protection (safety glasses with side shields or ventilated goggles), face shields, safety toed boots, and hearing protection. Welding operators will have welding helmets with the appropriate shade lenses (auto-darkening preferred) (#11- #13 for SMAW welding, #3 - #5 for cutting). Dependent on the processes and materials, welding helmets with powered air purification systems may be appropriate. Clothing will be fire resistant. Dependent on the process, leather (or equivalent) apron, capes, sleeves, or chaps may be appropriate. If full face respirators are required, they will be equipped with protective lenses. Insulated leather welding gloves (appropriate to the process) will be worn during welding, cutting and heating activities.

Welders and others exposed to Inert-gas metal arc welding must have all skin completely covered to prevent burns and other damage by ultraviolet rays.

Designated Hot Work Areas will be posted with the PPE requirements.

3.2.4 Hot Work in Confined Spaces

Any Hot Work within a confined space is a high hazard activity and requires a consultation and approval of the PESM. Job Specific Controls for the work will be developed.

When hot work is being performed in a confined space, welding machines and gas cylinders shall be left outside. Heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement. In addition to a hot work permit, all the requirements of EHS 6-1, Confined Space Entry, shall be followed, including the completion of a confined space entry permit.

3.2.5 Welding on Systems that Contain or Have Contained Flammable Liquids

Welding or Hot Work on systems that have, or have contained flammable liquids is a high hazard activity that requires consultation and approval from the PESM before any work is begun.. Job specific controls will be developed.

The following precautions shall be taken for hot work on systems that contain or contained flammable liquids.

- The part of the system being worked on must be isolated from other parts of the system containing flammable liquids or vapors. Isolation may be accomplished by plugging (i.e., using approved procedures and equipment), blanking, or removing from the system. Other approaches must be reviewed by the PESM.
- The isolated system must be purged, ventilated, or cleaned before welding, cutting, or brazing may be performed.
- Before purging, written calculations must be done to determine the time required to purge a certain size system with a
 given flow rate of an inert gas.
- After ventilation or cleaning a system, a lower explosive limit (LEL) reading must be taken at the area to be worked to
 ensure that there are no residual flammable vapors before welding or other hot work is conducted. A reading of 10% of
 the LEL is considered acceptable.
- When a part of a system (i.e., a pipe) is worked in place, protection must be accomplished by a combination of blanking-off and purging or blanking-off and cleaning.

3.2.6 Recordkeeping

Completed Hot Work Permits shall be returned to the PAI and shall be maintained as part of the project file. When hot work was performed on containers that contained flammable materials, information on the purging and measurements will be retained with the hot work permit.

3.2.7 Training

All persons involved in welding/hot work activities shall receive training on the requirements of this procedure. Training records shall be maintained in accordance with EHS 1-9, Recordkeeping.

4.0 GUIDANCE

The following guidance information is not mandatory unless imposed by a client or project documents.

4.1 Definitions

<u>Designated (Hot Work) Area</u> – A permanent, specific location designed or approved for hot work operations to be performed regularly (e.g., a maintenance shop or a detached defined outside location that is of noncombustible or fire-resistant construction), that is essentially free of combustible and flammable contents, and is suitably separated from adjacent areas. The Designated Area must be maintained free of combustibles as this area allows hot work at any time. A fire watch is not typically required.

<u>Fire Watch</u> – One or more dedicated individuals that observe (direct line of sight) during hot work activities and for a defined period afterwards to protect the Hot Work Operator from injury and to insure that no possibility of fire exists. Fire Watch individuals may have other duties: however the additional duties shall not distract them from their fire watch duties.

<u>Hot Work</u> – Hot Work is any temporary or permanent operation involving open flames or producing heat and/or sparks (cutting welding and heating). This includes but is not limited to: brazing, cutting, soldering, grinding, and welding. Hot work can also apply to the use of open flame or other temporary heating devices.

<u>Hot Work Operator</u> – An individual who performs hot work who is trained in NFPA 51 B, ANSI Z49.1, requirements, in the use of equipment, and in hot work permit controls,

<u>Local Exhaust Ventilation</u> – Local Exhaust Ventilation will consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. The system will be of sufficient capacity and arranged so as to remove fumes and smoke at the source and keep the concentration of them in breathing zone within safe limits.

<u>Mechanical Ventilation</u> – Mechanical ventilation consists of either general mechanical ventilation systems or local exhaust systems. General area mechanical ventilation is not generally satisfactory for health hazard control; however it may be helpful when used in addition to Local Exhaust system.

<u>Natural Ventilation</u> – Natural Ventilation is acceptable for welding, cutting and related processes where necessary precautions are taken to keep the operators breathing zone away from smoke,

Fumes and gases and where sampling of the atmosphere shows that the concentration of contaminates are below the allowable limits (OSHA and in some cases ACGIH recommendations). It includes avoiding fumes and gases by positioning of the work, the head, or by ventilation that captures or directs the fumes away from the face of the operator.

<u>Permit Authorizing Individual (PAI)</u> – An individual that has the experience and training to evaluate an activity for hazards designated by management.

<u>Soldering/Brazing</u> — Methods of joining metal by use of a filler metal. Soldering is defined as using filler with a liquidus not exceeding 840 degrees F. Brazing is performed at 840 degrees or greater, but both are below the melting temperature of the base metals.

<u>Task-Specific Hot Work Area</u> – Hot work that is performed outside of a Designated Area and for a specific task that is made fire safe by removing or protecting combustibles from ignition sources. Hot Work Permits are required for Task Specific hot work and are valid for one shift only. Fire watches are typically required.

<u>Thermite (Exothermic) Welding</u> - A process using finely powdered aluminum and iron oxide with other alloys (manganese, carbon, nickel, vanadium, chrome and others) to generate high heats and liquefy metals in a crucible. The liquid metal (iron, copper, etc) is then flowed into place with a form around the joint. Examples of materials typically joined include: copper grounding, railroad rails, reinforcing steel. Preheating of materials to 1000 degrees F is accomplished by use of a gas torch.

4.2 Background

The minimum requirements of this procedure are derived from OSHA 29 CFR 1926, 350 (Subpart J- Welding and Cutting). ANSI Z49.1 and NFPA 51B are often cited contractually. The additional requirements of these standards are contained in Section 4 Guidance. When these standards are imposed, the optional items in guidance become mandatory. When a Hot Work Permit is required, Attachment C (Hot Work Permit Example Form (NFPA 51B Compliant) should be used in these cases.

Hot Work performed in radiological areas or on radiologically contaminated materials will be controlled by the radiological work permits and this procedure.

4.3 Training

Personnel performing hot work under ANSI Z49.1 and/or NFPA 51B will receive training on the content of those standards, along with this procedure.

4.4 Postings

Proper postings for noise, fumes, electrical shock are to be in place (posted at entrances or on equipment or consumables

http://info.tteci.net/apps/groups/compliance/corpproc.nsf/d9055562b7654d27852572cf0... 6/21/2012

containers). If the equipment or consumable do not already contain precautionary information labels, the appropriate warning postings should be made, (Refer to the Figure 1 thru 4 in ANSI Z49.1 for content).

4.5 Hazard Analysis & PPE

An Activity Hazard Analysis will be conducted specifically for the welding, cutting or heating operation that will be performed. All required respiratory, eye, face, noise, head, foot, and skin protection equipment will be selected and shown on the AHA. Suitable fire extinguishing equipment of sufficient capacity will be provided in the immediate vicinity of hot work operations and maintained in a state of constant readiness. Material Safety Data Sheets (MSDS) should be available and reviewed as a part of the AHA process.

4.6 Fumes & Ventilation

Fumes and gases from hot work cannot be simply classified. The composition and quantity of fumes and gases are dependent upon the metal being worked, the process and consumables being used, coatings on the work, such as paint, galvanizing, or plating, and contaminates in the atmosphere. In welding and cutting, the composition of the fumes is usually different from the composition of the electrode or consumables. The determination of adequate ventilation is to sample the atmosphere that the workers are exposed to in accordance with the project Industrial Hygiene Plan.

ANSI Z49.1 and USACOE EM-385-1-1 includes materials of toxic significance and requires additional levels of ventilation, air monitoring or respiratory protection as shown in Table 4.6-1.

Table 4.6-1 Categories and Ventilation/Respiratory Protection (EM 385-1-1 & ANSI Z-49.1)*

Hot Work Type ¹	Local exhaust ventilation vented outside the confined space and personnel respiratory protection required.		
In Any Enclosed Space Antimony, Arsenic, Barium, Cadmium, Chromium, Chromium VI ² , Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Ozone, Selenium, Silver, and Vanadium			
Confined Spaces- Hot work Involving - Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Chromium IV ² , Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Ozone, Selenium, Silver, and Vanadium			
Confined Spaces – Hot Work Involving: - Fluorine gases - Zinc compounds	Local exhaust ventilation vented outside the confined space OR personnel respiratory protection required.		
Open Areas (Outside) involving Antimony, Arsenic, Barium, Cadmium, Chromium, Chromium IV ² , Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Ozone, Selenium, Silver, and Vanadium	Respiratory Protection required as well as engineering controls based on results of worker exposure assessment and exposure determination.		
Open Areas (Outside) Involving - Fluorine gases - Zinc compounds	Sampling to be performed to determine the need for respiratory protection or local exhaust.		
General Welding, Cutting & Heating - Oxygen cutting using iron powder or chemical flux - Gas Shielded Arc Cutting - Plasma Cutting	Local mechanical ventilation or other means to remove fumes generated.		

- * Any other employees exposed to the same atmosphere will be protected in the same manner as the welder or cutter.
- ¹ Workers may be exposed to hazardous concentrations of Chromium (IV) while welding, cutting or performing hot work on stainless steel, high chrome alloys or chrome-coated metal, or during the application and removal of chromate-containing paints and other surface coatings.
- ² When gas metal arch welding is performed on stainless steel, chrome alloy steel or chrome plated steel, personnel shall be protected by means of a local exhaust capable of maintaining exposures within permitted limits, or by other work and engineering controls, such as the use of argon-rich (>75% argon) shielding gas for use in gas metal arch welding (GMAW) or flux cored arc welding (FCAW). Whenever engineering and work controls are not sufficient reduce employee exposures, they will be supplemented by use of respiratory protection.

Where concentrations of airborne fume contaminates are to be determined by sampling of the atmosphere, the sampling will conducted inside the welding helmet in the welding operators breathing zone.

4.7 Daily Inspections

Hot work operators and fire watches will inspect their welding, cutting and heating equipment and personal protective equipment daily prior to use. The PAI will inspect Designated and Task Specific Hot Work Areas on a regular basis. Attachment B (Hot Work Precautions Checklist) is provided to assist in these inspections.

4.8 Thermite Welding

Thermite welding work will be controlled with a hot work permit when performed within 35 feet of any combustible materials. A fire watch will be maintained during the preheating and thermite welding for 30 minutes after the weld is completed. In areas without combustibles, the PAI may authorize thermite work as a Designated Area. Thermite powders and igniters will be stored separately and away from the work.

4.9 Soldering/Brazing

Soldering using flame heating devices and brazing will be controlled in accordance with ANSI Z49.1.for personnel protection. A fire watch will be maintained during and for 30 minutes after the completion of the soldering or brazing activity. Solder and brazing filler materials may contain lead, silver, tin, cadmium, and other metals.



5.0 REFERENCES

Please Describe Your Reference Here	Place Your Link In This Column	
1. OSHA 29 CFR 1926, Subpart J- Welding & Cutting	http://www.OSHAgov/	
2. OSHA 29 CFR 1926, Subpart F - Fire Protection & Prevention	http://www.OSHAgov/	
3. 29 CFR 1926, 1126 (Subpart Z)	http://www.OSHAgov/	
4. EHS 1-9, Recordkeeping	Q	
5. EHS 6-1, Confined Space Entry	Q	
6. ANSI Z49.1 Safety in Welding, Cutting and Allied Processes (2005)	http://www.aws.org/w/a/survey/standard.html? survey_start=z49_reqpdf	
7. EHS 5-2, Respiratory Protection	C	
8. NFPA 51B Standard for Fire Prevention During Welding,	Via Engineering Links	

Cutting and Other Hot Work (2003)	
9. USACOE EM-385-1-1 (2008) Section 10 Welding & Cutting (note requires AWS Z49.1	http://www.usace.army.mil/publications/eng- manuals/em385-1-1/toc.htm
10. DOE Work Safety & Health Rule 10 CFR 851	http://www.wipp.energy.gov/proc/pdf/851% 20Rule.pdf
11. American Conference of Governmental Industrial Hygienists TLV and BEIs	
12. Cooper Tube Handbook	http://tubebook.copper.org/publications



6.0 ATTACHMENTS

Please Provide a Description of the Attachment	Place Your Attachments Here	
A. Hot Work Permit Example Form	EHS 6-5 Attachment A - HW Permit 12-9-08.doc	
B. Hot Work Precautions Checklist	EHS 6-5 Attachment B HW Precautions Checklist 12-9-08.doc	
C. Hot Work Permit Example Form (NFPA 51B Compliant)	EHS 6-5 Attachment C - HW PERMIT NFPA Compliant-12-9-08.doc	
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Proprietary Information



EHS 6-5 ATTACHMENT A

HOT WORK PERMIT

☐ Task Specific Area Permit	
□ Designated Area Permit	Permit No.
Site Name:	
Site Location:	
Permit Issue Date:	Permit Expiration Date:
	ion where activity will be performed, and the processes to be used:
SAFETY ZONE for work establishe ☐ Cones ☐ Caution Tape ☐ I	d by (check all that apply) Natural Barrier ☐ Welding Screen ☐ Building ☐ Other, explain:
SAFETY REQUIREMENTS (check Fire Extinguisher properly rated Combustibles covered within 35 ft Cables, hose lines, regulators, cylinder	□ YES □ NO Fire watch present □ YES □ NO □ YES □ NO Work area clean □ YES □ NO
SAFETY EQUIPMENT (check all to face shield, □ local exhaust vent	that apply) respirator welders mask burning goggles ilation, and:
Are SPECIAL FIRE PROTECTIO	N procedures being implemented? (If yes, describe):
Refer to the Industrial Hygiene Pla	an for any air monitoring requirements.
PAI Name:	Signature/ Date/Time
Hot Work Operator	Signature/Date/Time
Air Monitor Name	Signature/Date/Time
Fire Watch Name	Signature/Date/Time

Attachment B - Hot Work Precautions Checklist

Hot Work Precautions Checklist

Yes	NO	NA	<u>General</u>
			Before initiating Hot Work, ensure that precautions are in place and an appropriate fire extinguisher is readily available.
			Are available sprinklers, hose streams and extinguishers in service and operable?
			Is Hot Work Equipment in good repair?
			If area is protected by smoke detectors, are they bypassed, covered or removed?
			Is a confined space permit required?
			Is there adequate ventilation to remove smoke or vapor from the work area?
			Is a lockout/Tagout required?
			Are noncombustible screens or shields in place to protect other persons in the vicinity from the direct rays of arc welding or cutting, sparks, slag or splatter? <u>Within 35 feet of the Work</u>
			Have flammable liquids, dust, lint and oil deposits been removed?
			Have sources of explosive atmospheres in the areas been eliminated?
			Have the floors been swept clean?
			Have combustible floors been wet down, covered with damp sand, or fire resistant sheets?
			Have other combustibles been removed where possible or otherwise protected with fire-resistant materials or metal shields?
			Are all wall, floor, duct, or tank openings covered or blocked?
			Are fire resistant tarps suspended beneath work?
			Work on Walls or Ceilings/Enclosed Equipment
			Is construction noncombustible and without combustible covering or insulation?
			Have Combustibles on other side of walls been moved?
			Is there a danger from the conduction of heat into another area?
			Is enclosed equipment cleaned of all combustibles
			Have containers been purged of flammable liquids/vapors?
			Fire Watch/Hot Work Area Monitoring
			Is a fire watch to be provided during and for 30 minutes after work is completed, including any breaks?
			Is the fire watch supplied with suitable extinguishers?
			Is the Fire Watch trained in the use of the extinguishers and in sounding fire alarm?
			Are Fire Watches available for adjoining areas, areas below or above?

Attachment C Hot Work Permit (NFPA Compliant)



Hot Work Permit

BEFORE INITIATING HOT WORK, ENSURE PRECAUTIONS ARE IN PLACE! MAKE SURE AN APPROPRIATE FIRE EXTINGUISHER IS READILY AVAILABLE!

This Hot Work Permit is required for any operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch-Applied Roofing, and thermite welding.

INSTRUCTIONS	Required Precautions Checklist (Check appropriate box)			
Verify precautions checked at right are in place, or do not	YES NO NA			
proceed with the work.	□ □ Available sprinklers, hose streams, or extinguishers are			
 Complete and retain a copy of this permit (provide original to the PAI when the permit is closed). 	in service and operable.			
WORK TYPE:	□ □ Hot work equipment in good repair.			
□ Cutting □ Welding □ Other	Requirements within 35 feet of hot work			
DATE: PERMIT NO.:	□ □ □ Flammable liquids, dust, lint, and oil deposits removed?			
LOCATION:	□ □ Explosive atmosphere in area eliminated.			
ECCATION.	□ □ □ Floors swept clean.			
NATURE OF JOB:	□ □ □ Combustible floors wet down, covered with damp sand			
	or fire-resistant sheets.			
NAME OF DEDOON DOING HOT MODIC	□ □ Remove other combustibles where possible. Otherwise			
NAME OF PERSON DOING HOT WORK:	protect with fire-resistant tarpaulins or metal shields.			
COMPANY NAME:	□ □ □ All wall and floor openings covered.			
	□ □ Fire-resistant tarpaulins suspended beneath work.			
I verify the above location has been examined and the	□ □ □ Vegetation removed or wet down.			
precautions checked on the Required Precautions Checklist have been taken to prevent fire.	More on walls or callings (analoged aguinment			
RESPONSIBLE SUPERVISOR:	Work on walls or ceilings/enclosed equipment			
NAME	□ □ Construction is noncombustible and without combustible			
(Printed)	covering or insulation.			
(* ************************************	□ □ Combustibles on other side of walls moved away.			
SIGNATURE:	□ □ Danger exists by conduction of heat into another area.			
START TIME: FINISH TIME:	□ □ □ Enclosed equipment cleaned of all combustibles.			
	□ □ Containers purged of flammable liquids/vapors.			
ASSIGNED FIRE WATCH:	Fire watch/hat wards area manitoring			
NAME:	Fire watch/hot work area monitoring			
	□ □ Fire watch will be provided during and for 30 minutes			
SIGNATURE:	after work, including any coffee or lunch breaks.			
Permit Authorizing Individual:	- □ □ Fire watch is supplied with suitable extinguishers.			
NAME:	□ □ Fire watch is trained in use of this equipment and in			
NAME:	sounding alarm.			
I verify that the location was inspected and determined to be fire safe and that the precautions checked on the Required	□ □ Fire watch may be required for adjoining areas, above			
Precautions Checklist are in place. Permission is authorized	and below.			
to start work.	□ □ Fire Watch waived (reason)			
SIGNATURE:	□ □ Notify the Health and Safety representative after hot			
THIS PERMIT IS GOOD FOR ONE DAY OR	work is complete.			
UNTIL EXPIRATION DATE AS NOTED				
Fire Watch DATE: TIME: AM	REPORT EMERGENCIES BY DIALING 911 ON ANY			
Completed: PM	SITE, COMPANY, OR CELL PHONE			
Required Personal Protective Equipment (PPE):	I verify that I conducted an inspection 30 minutes following			
,	completion of hot work and the area was in a fire safe condition.			
	NAME:			
	SIGNATURE:			

HSG2-2: Logbooks

Last Revision By: **Deborah Rambarose** on 11/16/2010

Created By: **Procedures Temp** on 11/06/1997

Purpose: This procedure addresses the requirements for developing, recording, and documenting conditions, progress, and health and safety data within a field health and safety logbook. The purpose of this procedure is to standardize the way health and safety logbooks are filled out within Tetra Tech EC, Inc. (TtEC) and to ensure that health and safety logbooks contain the necessary and required information

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- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 MAINTENANCE
- 4.0 DEFINITIONS
- 5.0 RESPONSIBILITIES
 - 5.1 Project Health and Safety Manager
 - 5.2 Health and Safety Officer
 - 5.3 Health and Safety Technician
- 6.0 PROCEDURES
 - 6.1 Logbook Issue
 - 6.2 Logbook Custody
 - 6.3 Logbook Entries
 - 6.4 Logbook Additions, Omissions, or Corrections
 - 6.4.1 Additions
 - 6.4.2 Corrections and Omissions
- 7.0 REFERENCES
- 8.0 ATTACHMENTS

1.0 PURPOSE

This procedure addresses the requirements for developing, recording, and documenting conditions, progress, and health and safety data within a field health and safety logbook. The purpose of this procedure is to standardize the way health and safety logbooks are filled out within Tetra Tech EC, Inc. (TtEC) and to ensure that health and safety logbooks contain the necessary and required information.

2.0 SCOPE

This procedure shall be followed by all health and safety personnel who are required to maintain a health and safety logbook as a part of their project responsibilities. The requirements of this procedure may be modified to meet project specific or client specific requirements if approved in advance by the Project Manager and the Regional Health and Safety Manager.

3.0 MAINTENANCE

The Director, Environmental Safety and Quality Programs is responsible for updating this procedure. Approval authority rests with TtEC's President and Chief Executive Officer. Suggestions for revision shall be submitted to both the department responsible for updating the procedure and the Executive Director Compliance and Corporate Counsel.

4.0 DEFINITIONS

Health and Safety Logbook - a bound book with hard cover and sequentially numbered pages protected by water resistant surface sizing (e.g. "write-in-the-rain"). Bound in this instance refers to the fact that the pages are glued and/or sewn together within the hard cover. Ring binding, comb binding, and clip bindings do not constitute a bound logbook. Synonymous with the term "logbook" throughout this procedure.

Correction - information recorded within the logbook the author desires to change by modifying the written contents of the logbook.

Omission/Deletion - information recorded within the logbook the author desires to omit/delete from the written contents of the logbook.

Addition - additional information the author wishes to add to the logbook contents at a later date.

Military time - time based on a 24-hour clock, e.g., 7:00 a.m. would be 0700 hours; 7:00 p.m. would be 1900 hours.

5.0 RESPONSIBILITIES

5.1 Project Health and Safety Manager (PHSM)

The PHSM shall oversee the implementation of this procedure by health and safety personnel in the field and may review or audit the contents of any health and safety logbook at any time.

5.2 Health and Safety Officer (HSO)

The HSO is usually the person assigned the task of completing the health and safety logbook in accordance with this procedure.

5.3 Health and Safety Technician (HST)

HSTs may make entries into the health and safety logbook if authorized to do so in writing by the HSO. If authorized, the HST shall complete the logbook in accordance with this procedure.

6.0 PROCEDURES

6.1 Logbook Issue

A health and safety logbook will normally be issued to the assigned project HSO. The logbook shall be configured as defined in Section 4.0 and may have a logbook control number permanently printed on the cover (Attachment 1). Logbooks do not have to be assigned to an individual.

The first blank page shall contain the following information:

- Logbook control number (repeated from cover)
- · Project name or other identifier
- Project location and address
- Issued to: (enter full name and initials of HSO and full names and initials of all HSTs authorized to make entry in the logbook, as applicable)
- Issued by: (enter name of FOL or SM, as applicable)
- Issue date: (enter month, day, year)
- Date returned: (enter date logbook is completed and returned to FOL or SM)
- Returned to: (enter name of FOL or SM receiving logbook, as applicable).

6.2 Logbook Custody

Once issued to the HSO, the project health and safety logbook remains in the legal custody of the HSO or authorized HST until returned to the Field Operations Leader or Site Manager. Assigned logbooks shall either reside directly with the HSO/HST or shall be locked in the HSO site files when not in use. It is recommended that the contents of the logbook be photocopied at the end of each work day and the photocopies stored in a separate location to protect against the accidental loss of the logbook and contents.

At the completion of a job the actual logbooks or photocopies shall be sent to the Corporate Health and Safety Director. These documents are considered a part of an employee exposure documentation.

6.3 Logbook Entries

All logbook entries should be relevant to the job at hand and factual. Logbook entries shall be made in the following manner:

- All logbook entries shall be made using waterproof, black or blue ink.
- All entries shall be written legibly or printed.
- Each logbook page shall be concurrently numbered beginning with Page 1.
- The date of each entry shall be recorded at the top of each page using the month-day-year format (e.g., July 4, 1992 or 7-4-92). Do not use a slash (/) to separate month-day-year as slashes can be mistaken for other letters or numbers.
- The project name and logbook control number shall be entered at the top of each page.
- Do not skip lines between entries or leave any lines on a page blank. If all lines on a page are not completely filled in, a slash line shall be drawn diagonally from the first available line to the bottom of the page.
- The HSO or HST making the entry shall sign the bottom of each page of entry as it is completed.
- Close out logbooks.

Logbook entries shall include at least the following information for each day of field activity:

- Description of the work activity
- First and last names and titles of personnel involved in the work activity (if possible)
- List of monitoring instruments used (include serial or ID number)

- Calibration information: Document pre- and post-calibration data for each instrument (when applicable). If a separate logbook is maintained, then the H&S logbook should reference the calibration logbook; and
- General weather description (temperature, cloud cover, estimated wind speed and direction, precipitation)

Chronologically list the activities of the work day. The following should be recorded at a minimum:

- Military time, location, and results of all monitoring instrument readings, including background readings. Specific locations (e.g., well numbers, site numbers, etc.) shall be listed.
- Note where readings were taken (e.g., breathing zone, well head space, by drill cuttings, etc.)
- Note level of protection and time spent by each worker in the specified level of protection.
- Health and safety observations relative to the conduct of the work at hand such as:
 - 1. Accidents, injuries and near misses
 - 2. Safety violations and corrective actions taken
 - 3. Upgrades or downgrades in levels of protection
 - 4. Instrument malfunctions and corrective actions taken
 - 5. The time of rest breaks. if taken
 - 6. Severe changes in weather
 - 7. Observations of additional contamination
 - 8. Signs of previous contamination adjacent to the work area
 - 9. Any ground contamination caused by the workers, who was notified, and what corrective action was taken
 - 10. Description of any unscheduled work stoppages or implementation of the site emergency plan
 - 11. Names and company affiliations of any site visitors
 - 12. Other information relevant to the health and safety program
- DO NOT put in opinions on events, just the facts.

6.4 Logbook Additions, Omissions, or Corrections

The health and safety logbook is viewed by the courts as a legally binding document. As a result, strict protocol governs any additions, revisions, omissions, or corrections made to the logbook after the initial entries were made or while they are being made. Failure to follow the proper procedure for making additions, corrections, or omissions to the health and safety logbook may result in the information contained within the logbook not being admitted as evidence in a court proceeding. Since all entries are made in ink and cannot be erased, the following procedure is necessary:

6.4.1 Additions

Additions may be made to a logbook, though should be kept to a minimum, and if deemed appropriate, in the following manner:

- Insert a caret (^) at the point in the logbook text where the addition is to be inserted
- · Add the new text at the caret using waterproof black or blue ink
- The author of the addition shall initial and date the addition (the author shall be among the authorized names listed at the front of the logbook) (Section 6.1).

6.4.2 Corrections and Omissions

Corrections or omissions/deletions may be made to a logbook in the following manner:

- Using waterproof black or blue ink, draw a single line through the information to be corrected
 or omitted. <u>DO NOT USE CORRECTION TAPE OR FLUID TO OBSCURE THE TEXT TO
 BE CORRECTED OR DELETED.</u> <u>DO NOT ERASE THE TEXT TO BE CORRECTED OR
 DELETED. ALL INFORMATION THAT HAS BEEN CROSSED OUT SHALL REMAIN
 LEGIBLE.</u>
- The author of the correction or omission shall initial and date the correction or omission (the author shall be among the authorized names listed at the front of the logbook) (Section 6.1). Use a caret to insert correct information if necessary (Section 6.4.1).

7.0 REFERENCES

None

8.0 ATTACHMENTS

Attachment 1 - Logbook Issue Information Attachment 2 - Logbook Examples

ATTACHMENT 1 LOGBOOK ISSUE INFORMATION

	<u>Project Name</u> H&S Logbook #1Issued by: J.
Smith (FOL)	Issued to: B. Jones (HSO) February
2, 1993	Returned to: J. Smith (FOL) March
4, 1993	r total riba to: G. Grillar (i G2) mai di

ATTACHMENT 2 (Page 1 of 4) LOGBOOK EXAMPLES

SO AND SO SITE 2 3-28-93

DRILLING OPERATION PERSONNEL:

ADAMS-H&S **BURNS - GEO** JONES - DRILLER ANDERSON - HELPER PETERS - DECON HELPER

LOP-D MW-24

OVA-S/N 008743 BKGD 0.2 PPM

(All readings in PPM)

	Time	BH	BZ	SS	Depth (ft)
	1300	BKGD	BKGD	BKGD	0-2
	1310	BKGD	BKGD	0.4	2-4
	1325	0.4	BKGD	10	4-6
	1350	10	BKGD	500	6-8 groundwater
_	1405	200	3	600	10-12 upgrade to C

Notes:

LOP - Level of Protection

MW - Monitoring Well BKGD - Background BH - Borehole

BZ - Breathing Zone

SS - Splitspoon

1245 Safety briefing held covering the chemical contaminants, drill rig climbing, decon procedure, eating and drinking, and personal injuries.

ATTACHMENT 2 (Page 2 of 4) LOGBOOK EXAMPLES

3-28-93 SO AND SO SITE Building 101 5

DRUM SAMPLING OPERATION PERSONNEL:

ADAMS - H&S ABREY - H&S - SAMPLER JONES - BACKUP HILL - BOTTLE HANDLER

LOP-MODIFIED A

OVA - S/N 008743 BKGD 0.2 PPM HNu-11.7 S/N 10084 BKGD 0.4 PPM CGI-S/N 008520 O₂ - 20.8% % LEL - 0

Time	#	Size	Vol (%)	Contents	DR INST.
0930	3	20 gal	100	Liquid	OVA-200
					HNu-600
					%LEL-0
					02-20.5
0945	5	55 gal	100	Granular	OVA-0.2
					HNu-0.4
1005	10	55 gal	50	Liquid	OVA->1000
					HNu->2000
					%LEL-20
					02-16.2

- 0800 Calibration of OVA #008743, HNu #10084, and MSA CGI 008520. All calibration information recorded in the cal. logbook.
- O820 Assemble equipment for drum sampling at Building 101. Equipment includes PPE, air delivery system radio communications, and first aid equipment.
- O850 Arrive at Bldg. 101. Set-up delivery system and provide a health and safety briefing to personnel concerning the history and hazards of Bldg. 101.

ATTACHMENT 2 (Page 3 of 4) LOGBOOK EXAMPLES

3-29-93 SO AND SO SITE

TRENCHING OPERATION PERSONNEL:

ADAMS - H&S BURNS - GEO JONES - BACKHOE OPERATOR

LOP-C TRENCH - TP-1 OVA-S/N 008743

BKGD - 0.2 PPM

Time	Length	Depth	Comments
0800	2'	2'	
0830	4'	6'	Drum (1) found rusty w/holes
0915	20'	8'	Drum (2) 55 gal rusty
1020	35'	8'	Drum (3) 55 gal
			crushed

5

ATTACHMENT 2 (Page 4 of 4) LOGBOOK EXAMPLES

3-29-93 SO AND SO SITE 3

TANK SAMPLING PERSONNEL:

ADAMS - H&S BURNS - GEO/SAMPLER

LOP-C

OVA-S/N 008743 BKGD 0.2 PPM HNu-S/N 10084 BKGD 0.2 PPM CGI-S/N 008723 O₂ - 20.8% %LEL - 0

Time	#	Size	Vol(%)	Contents	Dr Inst.
1430	1	5,000	1	Oily Liquid	OVA-0.2
					HNu-0.2
1440	2	500	50	White Liquid	OVA-200
					HNu-50

1500 Complete sampling of tank #1 and #2. Decon of personnel and equip complete. Return to support zone.

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Authors:

ATTACHMENT 1 SITE SAFETY AND HEALTH PLAN

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Base Realignment and Closure Program Management Office West 1455 Frazee Road, Suite 900 San Diego, California 92108-4310

CTO No. 0015

ATTACHMENT 1

FINAL

SITE SAFETY AND HEALTH PLAN

November 2013

PARCEL E SANITARY SEWER AND STORM DRAIN RADIOLOGICAL REMEDIATION AND SUPPORT HUNTERS POINT NAVAL SHIPYARD SAN FRANCISCO, CALIFORNIA

DCN: RMAC-0809-0015-0004

Prepared by:



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APPENDICES

Appendix A Forms

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ABBREVIATIONS AND ACRONYMS

٥F degrees Fahrenheit

ACO Administrative Contracting Officer

AHA **Activity Hazard Analysis** APP Accident Prevention Plan

Cal-OSHA California Occupational Safety and Health Administration

CCR California Code of Regulations

Comprehensive Environmental Response, Compensation, and Liability Act **CERCLA**

CFR Code of Federal Regulations CIH Certified Industrial Hygienist **CPR** cardiopulmonary resuscitation **CRC** contamination reduction corridor

CSP certified safety professional

CTO contract task order dBA decibels, A-scale

DON Department of the Navy

EHS environmental health and safety

EM **Engineer Manual** eV electron volt

FCR Field Change Request flame ionization detector FID

FOPS falling object protective structure **GFCI** ground fault circuit interrupter

GHS Globally Harmonized System

HAZWOPER Hazardous Waste Operations and Emergency Response

HPNS Hunters Point Naval Shipyard

kV kilovolt

LEL lower explosive limit

MSDS Material Safety Data Sheet **NEC** National Electrical Code

 O_2 oxygen

ABBREVIATIONS AND ACRONYMS

(Continued)

OSHA Occupational Safety and Health Administration

PESM Project Environmental Safety Manager

PID photoionization detector

PjM Project Manager PM Program Manager

PPE personal protective equipment

ppm parts per millions

ROICC Resident Officer in Charge of Construction

RPM Remedial Project Manager RSY radiological screening yard

SDS Safety Data Sheet

SHM Safety and Health Manager
SSHO Site Safety and Health Officer
SSHP Site Safety and Health Plan

TCRA time-critical removal action

TLV threshold limit value TtEC Tetra Tech EC, Inc.

WBGT Wet Bulb Globe Temperature

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

Tetra Tech EC, Inc. (TtEC) has been contracted by the Department of the Navy (DON) to conduct remedial actions for the removal of the storm drain lines and sanitary sewer system at Hunters Point Naval Shipyard (HPNS), San Francisco, California, under Naval Facilities Engineering Command Southwest Environmental Multiple Award Contract N62473-10-D-0809. The location is shown on Figure 1-1. This Site Safety and Health Plan (SSHP) applies to work that will be performed under this contract at Parcel E. The primary scope is to continue the storm drain and sanitary sewer system removal within Parcel E.

The DON has contracted with TtEC to continue the storm drain and sanitary sewer line time-critical removal action (TCRA) within Parcel E. To date, 23,401 linear feet of storm drain and sanitary sewer lines has been removed under prior contracts. This TCRA involves the removal of an additional approximately 7,600 linear feet of storm drain and sanitary sewer lines from Parcel E. Radiological Screening Yard (RSY)-4 will be used to radiologically clear the excavated soil. Following radiological processing, the excavated soil will be either staged in the DON-designated area pending reuse as backfill material in the excavated trenches or staged for off-site disposal at a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) landfill by the DON's disposal contractor.

1.2 APPLICATION

This SSHP is applicable to all work conducted by TtEC and its subcontractors. Essentially equivalent or additional health and safety procedures and practices may be approved by TtEC and implemented by its subcontractors where necessary. All subcontractors are required to follow the TtEC Health and Safety programs and procedures, unless changes are approved by the TtEC Project Environmental Safety Manager (PESM), who is a Certified Industrial Hygienist (CIH), and the DON Contracting Officer. The TtEC PESM will review TtEC and subcontractor SSHPs before fieldwork begins.

1.3 APPLICABLE STANDARDS, REGULATIONS, AND GUIDANCE DOCUMENTS

Adherence to applicable portions of federal, local, national consensus organization, and corporate health and safety standards, regulations, and guidance manuals is required during field activities. These include, but may not be limited to, the following:

- 10 Code of Federal Regulations (CFR) 20, Nuclear Regulatory Commission
- 29 CFR 1926, Occupational Safety and Health Standards, Construction Industry

- State regulations including Title 8 *California Code of Regulations* (CCR) (California Occupational Safety and Health Administration [Cal-OSHA]) and Title 24 CCR (*Health and Safety Code*)
- TtEC Corporate Health and Safety Program
- TtEC Project Rules Handbook
- Department of the Navy Environmental Restoration Program Manual (August 2006)
- U.S. Army Corps of Engineers Safety and Health Requirements Manual, Engineer Manual (EM) 385-1-1 (September 15, 2008) Consolidated August 2011
- Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, most current publication
- Occupational Safety and Health Guidance for Hazardous Waste Site Activities (U.S. Department of Health and Human Services 1985)

1.4 PLAN ORGANIZATION

This SSHP discusses many activities that may be performed during the storm drain and sanitary sewer removal in Parcel E.

1.5 SUMMARY OF MAJOR RISKS

HPNS had activities associated with shipbuilding and repair, maintenance, storage, and transportation. There is a potential for contact with insects, rodents, and snakes. There is potential contamination in various areas of the buildings. These contaminants may include fuels, solvents, metals, oils, polychlorinated biphenyls, asbestos, lead-based paints, and low-level radioactivity.

The San Francisco Police Department maintains laboratory facilities on HPNS in Building 606. Although a security fence surrounds the entire facility, HPNS has had trespassers, vagrants, and scavengers. There is a Defense Department Police Force on the facility periodically.

2.0 ORGANIZATION AND RESPONSIBILITIES

The following list identifies the key contacts for those agencies and individuals that are responsible for the oversight and/or implementation of the site activities. A project organization chart showing the relationship among select team members is provided as Figure 2-1.

Agency	Contact	Project Title
BRAC PMO West 1455 Frazee Road, Suite 900 San Diego, CA 92108	Catherine Haran (619) 532-0787 Chris Yantos (619) 532-0912	DON Remedial Project Manager (RPM)
Radiological Affairs Support Office (RASO) Building 19712-1 NWS P.O. Drawer 260 Yorktown, VA 23691-0260	Dr. Steven W. Doremus (757) 887-7745	Director, Environmental Protection Programs
Alameda Main ROICC Office 950 West Mall Square Bldg. 1, Suite 160, West Wing, Mail Stop 2 Alameda, CA 94501-7545	Shirley Ng (510) 521-8713	Project Engineer, ROICC
Alameda Main ROICC Office 950 West Mall Square Bldg. 1, Suite 160, West Wing, Mail Stop 2 Alameda, CA 94501-7545	Andrew Uehisa (510) 521-8742	Engineering Technician, ROICC
CSO Hunters Point Naval Shipyard 1 Avenue of the Palms, Suite 161 San Francisco, CA 94130	Mel Asuncion (415) 743-4721	CSO
CSO Hunters Point Naval Shipyard 1 Avenue of the Palms, Suite 161 San Francisco, CA 94130	Doug DeLong (415) 743-4713	CSO
California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control Office of Military Facilities 700 Heinz Ave., Bldg. F, Suite 200 Berkeley, CA 94710	Ryan Miya (510) 540-3775	Cal/EPA RPM
California Regional Water Quality Control Board (Water Board) 1515 Clay Street, Suite 1400 Oakland, CA 94612	Ross Steenson (510) 622-2445	Water Board RPM
TtEC Hunters Point Naval Shipyard 200 Fisher Avenue San Francisco, CA 94124	Bill Dougherty (415) 216-2731 office (415) 238-7006 cell	Project Manager (PjM)

Agency	Contact	Project Title
TtEC Hunters Point Naval Shipyard 200 Fisher Avenue San Francisco, CA 94124	Shanti Montgomery (415) 216-2772 office (360) 320-8519 cell	Assistant PjM
TtEC Hunters Point Naval Shipyard 200 Fisher Avenue San Francisco, CA 94124	Jeff Bray (415) 216-2774 office (415) 412-6843 cell	Construction Manager
TtEC Hunters Point Naval Shipyard 200 Fisher Avenue San Francisco, CA 94124	Dennis McWade (415) 216-2761 office (580) 670-0292 cell	Project Superintendent
TtEC Hunters Point Naval Shipyard 200 Fisher Avenue San Francisco, CA 94124	Rich Kanaya (415) 216-2759 office	Project Quality Control Manager (PQCM)
TtEC Hunters Point Naval Shipyard 200 Fisher Avenue San Francisco, CA 94124	Dan Keenan, CSP (415) 216-2750 office (415) 272-1015 cell	Site Safety and Health Officer (SSHO)
TtEC Hunters Point Naval Shipyard 200 Fisher Avenue San Francisco, CA 94124	Andrew Gorman (415) 216-2737 office (425) 241-0713 cell	Alternate SSHO
TtEC Hunters Point Naval Shipyard 200 Fisher Avenue San Francisco, CA 94124	Jeff Ambrose (415) 216-2758 office (509) 260-1144 cell	Radiation Safety Officer Representative (RSOR)
TtEC 1230 Columbia Street, Suite 750 San Diego, CA 92101	Greg Joyce (360) 780-0371 cell	Quality Control (QC) Program Manager
TtEC 1230 Columbia Street, Suite 750 San Diego, CA 92101	Roger Margotto, CIH, CSP, CHMM (619) 471-3503 office (619) 988-0520 cell	Certified Industrial Hygienist (CIH), Project Environmental Safety Manager (PESM)
TtEC Twin Oaks, Suite 309 5700 Lake Wright Drive Norfolk, VA 23502	Erik Abkemeier, CHP, PE, CSP (757) 944-0921	Radiation Safety Officer (RSO)/Project Certified Health Physicist (CHP)

Abbreviations and Acronyms:

BRAC – Base Realignment and Closure

Cal/EPA – California Environmental Protection Agency

CHMM – Certified Hazardous Materials Manager

CHP – Certified Health Physicist

CIH – Certified Industrial Hygienist

PESM – Project Environmental Safety Manager

PjM – Project Manager

PMO – Project Management Office

ROICC – Resident Officer in Charge of Construction

RPM – Remedial Project Manager

CSO – Caretaker Site Office CSP – Certified Safety Professional DON – Department of the Navy NAVFAC SW– Naval Facilities Engineering Command Southwest TtEC – Tetra Tech EC, Inc.
PE – Professional Engineer
RSO – Radiation Safety Officer
RSOR – Radiation Safety Officer Representative
SSHO – Site Safety and Health Officer
Water Board – Regional Water Quality Control Board

2.1 PROGRAM MANAGER

The Program Manager (PM) has the overall responsibility for the health and safety of site personnel at all projects under this contract. The PM will ensure that adequate resources are provided to the field health and safety staff to carry out their responsibilities as outlined below. The PM will also ensure that fieldwork is scheduled with adequate personnel and equipment resources to complete the job safely.

2.2 PROJECT MANAGER

The Project Manager (PjM) is responsible for managing all technical and business aspects of the project. This includes the development of the best technical approach and budget for the CTO scope; managing technical, cost, schedule, and project issues as work progresses; and subcontractor oversight. The PjM will also ensure that adequate personnel and resources are available to complete the project safely. TtEC Environmental Health and Safety (EHS) Procedure 1-2 (EHS 1-2) (see Appendix B of the Accident Prevention Plan [APP]/SSHP for copies of the TtEC EHS procedures) specifies that line managers (PjMs, Project Superintendents, and Site Supervisors) have the responsibility to integrate loss control principles into all operations and to ensure that:

- All projects are implemented in compliance with all environmental, safety, and health laws and regulations, EHS program requirements, and Environmental Management System requirements.
- EHS plans are developed, approved, and implemented in accordance with TtEC requirements.
- Personnel understand the requirements of the project EHS plan(s) and each individual understands his/her responsibility for plan implementation.
- Personnel have all required training and are capable of performing all assigned tasks.
- Facilities and equipment meet TtEC and government regulations.
- Work rules are enforced.
- Inspections and incident investigations are conducted per program requirements. The PjM or designated manager will conduct monthly health and safety inspections of the job site.
- Effective corrective actions are implemented in a timely manner following inspections, audits, incident investigations, and so forth.
- Clients are notified of TtEC incident reporting procedures.
- Appropriate disciplinary action is implemented by line supervision when necessary.

2.3 PROJECT SUPERINTENDENT

The Project Superintendent is responsible for ensuring that all work is performed in accordance with the contract requirements in a safe and healthful manner. As a line manager, the Project Superintendent has the same responsibilities for health and safety program implementation as the PjM. The Project Superintendent will:

- Ensure that work crews have adequate resources to effectively conduct field activities.
- In conjunction with the Site Safety and Health Officer (SSHO), ensure that proper protective equipment is being used by all personnel.
- Ensure that appropriate disciplinary actions are taken when health and safety requirements are not being followed or when unsafe practices occur.
- Oversee work practices to verify that they are in accordance with the SSHP.
- Understand and be familiar with the SSHP.
- Participate in the daily tailgate safety meetings.
- Observe project personnel for signs of chemical or physical trauma.
- Immediately notify the SSHO and the PESM of any illness, accident, injury, or nearmiss incident.
- Correct any hazards disclosed by project workers or the SSHO.

The Project Superintendent has the authority to suspend field activities if the health and safety of personnel are in danger.

Upon request, the Project Superintendent will submit to the DON Administrative Contracting Officer (ACO) copies of the certificates (or acceptable alternative documents) of the most recent health and safety training required by 29 CFR 1910.120 for all the personnel who will be working on-site. Copies of the training documentation will also be kept at the work site.

2.4 PROJECT ENVIRONMENTAL SAFETY MANAGER

The PESM is responsible for implementing and overseeing the Health and Safety Program, as well as developing, implementing, and approving the SSHP. Any changes to the established SSHP are at the direction and approval of the PESM, with concurrence of the DON ACO. The PESM or designee will not necessarily be on-site during all remedial activities, but will be readily available for consultation when required.

The PESM or designee is CIH certified by the American Board of Industrial Hygiene. The PESM supervises and directs the activities of the SSHO. The PESM has the authority to stop unsafe operations, remove unqualified personnel from the work area, and approve changes to the SSHP.

Duties of the PESM include:

- Overseeing all aspects of the SSHP from development to implementation
- Advising the SSHO on related health and safety aspects
- Reviewing the site-specific plan for completeness and compliance
- Reviewing other site documents as they affect health and safety (Activity Hazard Analyses [AHAs], Sampling Plans)
- Reviewing and evaluating monitoring results
- Establishing and monitoring related health and safety procedures through site safety inspections and audits
- Ensuring that TtEC employees receive required EHS regulatory training
- Fulfilling specific responsibilities for project EHS personnel that are identified within each EHS procedure
- Functioning as a technical resource for all environmental compliance, safety, loss control, and industrial hygiene issues

2.5 SAFETY AND HEALTH MANAGER/SITE SAFETY AND HEALTH OFFICER

The Safety and Health Manager (SHM)/SSHO, or designee deemed appropriate/equivalent to the SSHO, will be present on-site full-time while work is being performed and is responsible for all health and safety activities and the delegation of duties to the health and safety staff in the field. The SSHO reports directly to the PESM. The SSHO is responsible for implementing the SSHP, ensuring that appropriate personal protective equipment (PPE) is used relative to the hazard that may be encountered, verifying that communication systems are in place, monitoring conformance with safety and emergency response procedures, giving safety briefings, seeing that safety equipment is maintained, and conducting safety drills and exercises. The SSHO or designee is responsible for the setup and execution of decontamination procedures. The SSHO has stop work authorization, which will be executed upon determination of an imminent safety hazard or potentially dangerous situation. Work cannot restart until clearance has been authorized by the SSHO. The SSHO is responsible for maintaining the site health and safety logbooks.

The SSHO possesses the knowledge and experience necessary to ensure that all elements of the approved SSHP are implemented and enforced on-site. Each TtEC SSHO has a minimum of 5 years of construction industry safety experience, or 3 years if possessing a Certified Safety Professional (CSP) designation or safety and health degree. Each SSHO has completed the 30-hour Occupational Safety and Health Administration (OSHA) Construction safety class or equivalent formal training, as well as 16 hours training on TtEC-specific safety policies and environmental standards and compliance. Every SSHO is certified as having completed training

in first aid and cardiopulmonary resuscitation (CPR) by a recognized organization such as the American Red Cross Association. EHS 1-2 states that the SSHO has the responsibility to:

- Ensure that TtEC employees understand the requirements of TtEC EHS programs and procedures through training and communication.
- Develop or assist with the development of EHS plans in conjunction with project personnel.
- Assist management with EHS plan implementation.
- Perform specific tasks in accordance with EHS plans.
- Fulfill the specific responsibilities for project EHS personnel that are identified within each EHS procedure.
- Conduct daily safety and health inspections and maintain a written log that includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, and estimated and actual dates of corrections. Attach safety inspection logs to the Contractor's Daily Production/Quality Control Reports.
- Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 or equivalent.
- Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. Post a list of unresolved safety and health deficiencies on the safety bulletin board.
- Ensure subcontractor compliance with safety and health requirements.

Additional responsibilities, as described in the TtEC EHS program, include but are not limited to:

- Investigating accidents, injuries, illnesses, near-misses, and other incidents.
- Ensuring that employees are trained on the hazards of hazardous substances used on any project; maintaining Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) files to provide easy access to all employees; and performing inspections to ensure that all containers are labeled.
- Ensuring that the SSHP is read, understood, and signed by all field personnel including subcontractors. The SSHP will be maintained and updated as needed, and one copy will be placed on or near the site safety bulletin board and postings.
- Ensuring that tailgate safety meetings are conducted on days that work is performed; ensuring that meetings and any other additional training are documented.
- Assessing employee exposure through specified monitoring protocols and ascertaining that protective measures are appropriate.
- Verifying that project safety equipment is inspected, as required by EHS program.
- Reporting to the Resident Officer in Charge of Construction (ROICC), within 24 hours, all incidents required to be reported by EM 385-1-1; immediately report to

the ROICC any fatal injury, one or more persons admitted to a hospital, or damage to government property.

- Verifying that all personnel have the necessary training and medical clearance prior to entering the exclusion zone or contamination reduction zone of any site. The SSHO will inform the Project Superintendent of any site personnel with medical restrictions.
- Determining and posting routes to medical facilities and emergency phone numbers; arranging for emergency transportation to medical facilities.
- Maintaining training records and medical certifications for all on-site personnel including subcontractors.
- Serving as the Project Hazard Communication Coordinator.

On this project, Dan Keenan, CSP, will function as the SHM/SSHO. Andrew Gorman will function as the Alternate SSHO.

2.6 SITE PERSONNEL

The PiM or Project Superintendent will select personnel to function as supervisors as needed. Supervisors will ensure that their subordinates comply with the requirements of this plan. A list of personnel authorized to have access to the remediation or work site will be compiled and maintained on-site by the SSHO. This list will include employees of TtEC, subcontractors, and representatives of governmental agencies that may require access, where possible. authorized personnel will meet the requirements of the CTO SSHP and be approved by the SSHO or Project Superintendent prior to entering any exclusion zone or controlled area when potentially hazardous activities are being conducted.

Although the employer is responsible for providing a safe and healthful workplace, employees are responsible for their own safety as well as the safety of those around them. Employees will use all equipment in a safe and responsible manner as directed by the Project Superintendent. All TtEC personnel will follow the policies set forth in this SSHP and the TtEC EHS Programs. Each employee is responsible for immediately reporting any injuries, incidents, and safety infractions to a project supervisor or the SSHO so treatment can be obtained and/or corrective action taken. Equipment operators are responsible for the maintenance, inspection, and safe operation of their equipment. They will report any equipment malfunctions or necessary repairs to a project supervisor.

2.7 PROJECT QUALITY CONTROL MANAGER

The Project Quality Control Manager inspects the preparatory and initial phases of projects for compliance with health and safety requirements.

2.8 SUBCONTRACTED PERSONNEL AND THIRD PARTIES

All subcontracted personnel are responsible for compliance with this SSHP and other applicable regulations. Subcontractor personnel must receive a briefing from the SSHO prior to unescorted

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access to the project site. They must acknowledge receipt of the plan and the hazard communication briefing. Subcontractors are responsible for providing their personnel with appropriate PPE, as specified by the plan. Subcontractor and third-party personnel have the authority to request a work area hazard assessment by the SSHO prior to the commencement or continuation of work.

Hazards not listed in the APP but known by the subcontractor, or known to be associated with a subcontractor's specialty, must be identified by and addressed in the subcontractor's health and safety plan and during the daily tailgate meeting prior to beginning work. The subcontractor will inform the SSHO and the PjM. The subcontractors will also develop AHAs for review by the SSHO and the PESM or they will coordinate the completion of AHAs with the SSHO for subsequent review by the PESM.

Subcontractors will:

- Provide up-to-date documentation of training (Hazardous Waste Operations and Emergency Response [HAZWOPER] refresher training, waste management training, etc.) and medical certification for work in the exclusion zone and contamination reduction zone.
- Report incidents and accidents immediately to the Project Superintendent or the SSHO.
- Have a Drug-free Workplace Program in compliance with the Federal Drug-free Workplace Act.

3.0 SITE HISTORY AND PROJECT DESCRIPTION

The following sections provide a description of HPNS and its history.

3.1 SITE DESCRIPTION AND BACKGROUND

HPNS was acquired by the DON in 1939. The main portion of HPNS is situated on a long promontory located in the southeastern part of San Francisco, extending eastward into San Francisco Bay. The promontory is bounded on the north and east by San Francisco Bay and on the south and west by the Bayview/Hunters Point District of San Francisco. Presently, the on-base property at HPNS consists of 866 acres, of which 420 acres is on land and 446 acres is below bay waters.

In 1992, the DON divided HPNS into five contiguous parcels (A through E) to expedite remedial action activities and land reuse. Parcel F was designated in 1996 and encompasses the offshore areas. The DON designated the landfill area in Parcel E as Parcel E-2 in September 2004. Subsequently, Parcel A was transferred to the City and County of San Francisco. In July 2008, the DON redivided HPNS into eight parcels (B, C, D-1, D-2, E, E-2, G, and F) and three utility corridors identified as UC1, UC2, and UC3 (Figure 3-1). The onshore areas are designated Parcels B, C, D-1, D-2, E, E-2, and G; the offshore areas continue to be designated as Parcel F (Figure 3-1).

3.2 HUNTERS POINT NAVAL SHIPYARD HISTORY

The promontory on which HPNS is located has been recorded in maritime history since 1776. First, it was recorded as Spanish mission lands used for cattle grazing and later, in the 1860s, for its dry-dock facilities. In 1939, the U.S. government received title to the land at Hunters Point and in 1941, at the start of World War II, began developing it as a shipyard. From 1945 to 1974, HPNS was used predominantly as a repair facility by the DON. The DON operated the shipyard as a ship repair facility through the late 1960s. HPNS was deactivated in 1974 and remained relatively unused until 1976.

In 1976, the DON leased 98 percent of HPNS to a private ship repair company, Triple A Machine Shop, Inc. (Triple A). Triple A leased the property from July 1, 1976, to June 30, 1986. Triple A did not vacate the property until March 1987. During the lease period, Triple A used dry docks, berths, machine shops, power plants, various offices, and warehouses to repair commercial and DON vessels and also subleased portions of the property to various other businesses.

In 1986, the DON resumed occupancy of HPNS. Many of the subtenants under Triple A's lease remained tenants under the DON's reoccupancy in 1986.

Because past shipyard operations left hazardous materials on-site, HPNS property was placed on the National Priorities List in 1989 as a Superfund site pursuant to CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986. In 1991, HPNS was placed on the DON's Base Realignment and Closure list, and its mission as a DON shipyard ended in April 1994. A 1998 BRAC decision requires full closure and cleanup of HPNS. Closure activities are currently under way.

3.3 SURROUNDING LAND USE

The land at HPNS can be divided into three functional areas: 1) the industrial production area, which consists of the waterfront and shop facilities for the structural machinery, electrical, and HPNS service groups; 2) the industrial support area, which consists of supply and public works facilities; and 3) the nonindustrial area, which consists of former DON personnel residential facilities, recreational areas, and a restaurant. The industrial production area occupies the north and east portions of HPNS (Parcels B and C); the industrial support area occupies the south and southwest portions of HPNS (Parcels D, G, and E); and the nonindustrial area occupies the northwest and central portions of HPNS (Parcel A). Parcels B and E also contain nonindustrial buildings. The land surface at Parcels B, C, D, and G is mostly covered by asphalt, buildings, or other structures. The majority of the land in Parcel E remains unpaved.

3.4 PROJECT DESCRIPTION

The major field activities associated with the project include the following:

- Clearing of vegetation and pavement
- Geophysical investigations and utility clearance of excavation areas
- Establishment of soil and debris stockpile areas
- Excavation of impacted storm drain and sanitary sewer piping and associated components
- Transfer and radiological surveying and sampling of soil at the RSY
- Post-excavation radiological surveying and sampling
- Backfill and compaction with non-impacted excavated soils or clean import material
- Establishment of new storm drainage system/site restoration

Other remedial activities to be performed may include removal of contaminated debris, equipment, or materials.

4.0 POTENTIAL HAZARDS

Hazards associated with the project site, including chemical, environmental, and physical hazards, are summarized below. Some of the more commonly used health and safety forms referenced in the following paragraphs are included in Appendix A.

4.1 CHEMICAL HAZARDS

Based on site history and previous work experience at HPNS, there is a potential that chemical hazards may be encountered outside of known Installation Restoration Program sites. Chemicals of concern from previous removals include polychlorinated biphenyls, pesticides, metals (particularly lead associated with lead-based paint), and petroleum hydrocarbons associated with gasoline and diesel fuel. Site workers will be made aware of the potential for encountering chemical hazards and will notify the SSHO immediately if odors, discolored soil, or unknown drums are found. MSDSs/SDSs for the potential contaminants and any additional chemicals found on-site or brought onto the site will be acquired and reviewed with all personnel during daily safety meetings. The PESM and SSHO will initially specify the levels of protection and air monitoring requirements based on the data provided or obtained prior to characterization activities. These requirements may change as site conditions are more fully evaluated.

TtEC's protective equipment requirements, combined with the requirement to wash arms, face, and hands before eating or smoking, should prevent exposure through these routes. In addition, the project SSHO and project supervisors will observe and warn the crew members to be aware of the initial symptoms of chemical exposure. The amount of exposure depends primarily on the specific activities undertaken and the care with which the activities are performed. A supervisor will remove any crew member from the work site and have the worker medically evaluated if the following initial symptoms persist and are unexplained by other causes (such as allergy, common cold, heat stress, etc.):

- Dizziness or stupor
- Nausea, headaches, or cramps
- Irritation of the eyes, nose, or throat
- Euphoria
- Chest pains and coughing
- Rashes or burns

4.1.1 Hazard Communication Program

The purpose of a Hazard Communication or Employee Right-To-Know program is to ensure that the hazards of all chemicals located at the project site are communicated according to 29 CFR

1926.59 (29 CFR 1910.1200) (8 CCR 5194 and 5155) regulations to all TtEC personnel and subcontractors. EHS 4-2 is the written hazard communication program. This program requires:

- Container Labeling Personnel will ensure that all drums and containers are labeled according to contents. These drums and containers will include those from manufacturers and those produced on-site by operations. All incoming and outgoing labels will be checked for identity, hazard warning, and name and address of the responsible party.
- MSDSs/SDSs There will be an MSDS/SDS located on-site for each hazardous chemical used or known to be on-site.
- Employee Information and Training Training employees on chemical hazards is accomplished through formal safety training conducted annually and informal safety meetings. Project-specific chemical hazards are communicated to employees through an initial site orientation meeting and during daily safety meetings held at field projects. This training will be documented.

In 2012, the new Globally Harmonized System (GHS) for hazard communication was adopted, and U.S. implementation is scheduled to be complete by June 2016. Part of the implementation requires chemical manufacturers to switch from MSDSs to SDSs. Over the course of this project, the MSDS/SDS collection on-site is expected to include either or both variations of the hazard documents as they are released by the manufacturers. Full implementation of this GHS standard is not required until after the period of performance for this contract has ended.

4.2 ENVIRONMENTAL HAZARDS

The SSHO or a supervisor will discuss environmental hazards associated at work site location at the orientation meeting prior to start-up of field activities.

4.2.1 Weather and Heat Stress

With the possible combination of ambient factors such as high air temperature, a few days with high relative humidity, low air movement, high radiant heat, and protective clothing, the potential for heat stress is a concern. The potential exists for:

- Heat rash
- Heat cramps
- Heat exhaustion
- Heat stroke

EHS 4-6 describes the heat stress management and prevention program. At 70 degrees Fahrenheit (°F) ambient temperature, the supervisor on-site initiates the procedures in the program.

Heat stroke, heat cramps, and heat exhaustion are covered in detail during the 40-Hour OSHA 29 CFR 1910.120 (8 CCR 5192) pre-employment course. In addition, this information is discussed during a safety "tailgate" meeting before each workday where heat stress may be a factor. Workers are encouraged to increase consumption of water and electrolyte-containing beverages such as Gatorade[®] during warm weather. Water and electrolyte-containing beverages will be provided on-site and will be available for consumption during work breaks.

At a minimum, workers will break every 2 hours for 10- to 15-minute rest periods. In addition, workers are encouraged to take rests whenever they feel any adverse effects, especially those effects that may be heat-related. The frequency of breaks may need to be increased upon worker recommendation or decision of the SSHO and a supervisor.

Workers need to protect themselves from sunburn. Workers should wear clothing that protects them from the sun or otherwise wear a sunscreen lotion with a skin protection factor of 15 or greater. TtEC will provide sunscreen lotion to all workers. Use of a sunscreen lotion that is resistant to perspiration is preferred.

The EHS procedure also describes a cold stress program; however, due to the location of the HPNS, it is unlikely that there will be a need to implement this program.

4.2.2 Biological Hazards

Because biological hazards may be encountered on-site, workers should anticipate the increased likelihood of encountering these hazards, especially in and around buildings and in undeveloped outdoor areas. Animal bites and insect stings can cause localized swelling, itching, and minor pain that can be handled by first aid treatment. In sensitized individuals, however, effects such as anaphylactic shock can be more serious and can lead to severe reactions in the circulatory, respiratory, and central nervous system, and in some cases, even death. The SSHO will identify personnel with a known reaction to bites and stings at the pre-job safety orientation meeting. Personnel will not attempt to capture or feed any wild or semi-wild animals, such as cats, rats or ground squirrels, due to the possibility of a bite or parasitic infestation.

- Animal and bird droppings often contain mold, fungus, or bacteria that represent a significant respiratory hazard including lung diseases and allergies. Personnel will not touch droppings they can see and will wear gloves and Tyvek® protective wear, at a minimum, when going into normally limited access areas such as crawl spaces and high ceilings that may have become refuges or nesting areas.
- The hantavirus, which is sometimes transmitted by rodents found in the southwestern United States, causes respiratory distress, sometimes with fatal consequences. Similarly, rats transmit the arenavirus. Transmission of the hantavirus or arenavirus occurs with exposure to rodent droppings. Good hygiene practices such as washing hands and face prior to eating and drinking will help to minimize the potential for exposure to the hantavirus. While work is in progress, use of P-100 filter cartridges

and work practices that minimize generation of dust and aerosols will help protect employees. Avoiding areas where there are concentrations of mouse droppings (hantavirus) or rat droppings (arenavirus) minimizes exposure to either virus. The virus can be inhaled in the dust from areas where mice or rats have nested or left their droppings. Minimizing dust inhalation or avoiding these areas will lessen the risks of exposure. Any work in such areas should be done only with full Level C protection including, at a minimum, a P-100 air-purifying respirator. Thorough washing of hands and face after removing the PPE will further minimize the potential for exposure.

• Personnel must use extreme caution when walking through an area, around buildings, and near objects such as drums and containers where a snake is likely to rest during the daytime. If a snake is encountered, slowly and quietly back away from the snake and inform all personnel of its location. Do not attempt to move or kill a snake as certain snakes are protected under state and federal laws. In the event of snakebite, do not try to move the affected individual. Wipe off the skin, as the venom will attack intact skin. Do not suck out the venom. Do not cut open the wound. Do not apply ice or ice packs. Do not use a tourniquet. Do not administer alcohol or medications. Call for medical assistance.

4.2.3 Storm Protection

If a warning of gale-force winds is issued, take precautions to minimize danger to persons, and protect the work and any nearby property. Precautions will include closing of all openings; removing loose materials, tools, and equipment from exposed locations; and removing or securing other temporary work. Close all openings in the work site if storms of a lesser intensity pose a threat to property. The SSHO will ascertain predicted daily weather conditions by listening to daily weather forecasts on radio or television. If particularly ominous weather conditions are predicted, the SSHO will monitor radio broadcasts regularly or through National Weather Service reports.

The supervisor or SSHO will stop all work when wind speeds are 25 miles per hour or higher. The supervisor and the SSHO will assess what work procedures can be safely performed when wind conditions exceed 25 miles per hour. They will give consideration to fugitive dust and odor emissions, the safety of equipment in high winds, and protection of workers from flying debris and dust in windy conditions. No crane or boom work is permitted in winds at 25 miles per hour or higher. (Certain crane manufacturers may specify lower wind speed limitations for safe operations. The SSHO must ensure that operational limitations of these cranes are not exceeded.) No cranework is anticipated for field activities under this CTO. Elevated work platform and articulated boom lift work will be evaluated and may be stopped if wind conditions exceed 25 miles per hour or are otherwise determined to be causing an unsafe condition.

Activities near, in, or on water will stop work and conditions will be evaluated before allowing work to continue. The bay can become dangerous when there are high winds or high tides. The

project SSHO and superintendent will make a decision as to whether work can continue, work can continue with modifications, or work must be stopped.

4.3 PHYSICAL HAZARDS

There are numerous physical hazards associated with a project which, if not identified and addressed, could present accidents and personal injury to the workforce, as well as operational problems. To minimize physical hazards, TtEC has developed standard safety protocols that will be followed at all times. Failure to follow safety protocols or continued negligence of these policies will result in discipline of the employee. The TtEC Project Rules Handbook states the health and safety project rules and guidelines. Some of these are described in this section and in Section 10.0 of this SSHP. All TtEC personnel will follow these requirements as specified here and in the Project Rules Handbook. Supervisors will observe the general work practices of each worker and enforce safe procedures to minimize physical hazards. Hard hats, safety glasses, and safety boots are required in all areas of the work site unless specifically exempted by the PESM, SSHO, or a supervisor.

4.3.1 Tripping, Slipping, and Falling Hazards

Supervisors will remind personnel and subcontractors daily to maintain sure footing on all surfaces. Prior to first time entry, the supervisor and the SSHO will inspect all work areas prior to the start of work to look for hazards. Hazards in the work area will be identified with high-visibility spray paint, traffic cones, or barricade tape. The work areas must be illuminated to at least 30 foot-candles (EM 385-1-1, Table 7-1). Where engineering controls such as guardrails cannot be installed or used, personnel working 6 feet above any surface (including elevating work platforms), are required to wear safety harnesses and safety lanyards attached to an anchorage that can support 5,000 pounds. The SSHO will inspect these before use. To minimize tripping hazards caused by debris, job supplies, and equipment, personnel will remove this material from the work areas daily and stockpile the materials and place equipment in storage areas. The SSHO will enforce this "housekeeping" effort throughout the day.

Workers will not work near the edges (less than 6 feet) of excavations without fall protection where there is a vertical drop potential greater than 6 feet. If the excavation is 6 feet or greater, workers will wear a full body harness attached to a lanyard or self-retracting lifeline if they come within 6 feet of the edge of the excavation. The lanyard or lifeline is then attached to an anchorage point that can withstand 5,000 pounds of force.

Truck drivers and equipment operators will not climb into vehicles or equipment unless there are installed foot platforms and hand-hold devices. In no case will any worker, operator, or driver climb 6 feet or higher unless the person is using a personal fall arrest system as described above. The point of attachment must be above the worker's head when standing upright.

4.3.2 Noise

On projects where noise levels may exceed a time-weighted average of 84 decibels, A-scale (dBA), hearing protection will be made available to all exposed employees. Additionally, sound-level monitoring using a sound level meter may be conducted on-site if the SSHO determines that equipment noise is louder than normally encountered with the equipment. Annual audiograms are required for personnel who are exposed to 85 dBA time-weighted average or greater for 8 or more hours per day. Personnel with a standard threshold shift will be restricted from high noise exposure or will be required to wear hearing protection at all times. EHS 4-4 is a hearing conservation program complying with OSHA regulations (29 CFR 1910.95) (8 CCR 5095 through 5100).

4.3.3 Head and Back Injuries

At a minimum, workers will don hard hats, safety boots, and safety glasses prior to performing any site activities. This will prevent minor injuries caused by bumping one's head while working around structures or equipment. Personnel are instructed in proper lifting techniques and will not lift heavy items without assistance per EHS 3-1. Each worker will not lift more than 50 pounds. Objects heavier than 50 pounds require assistance from another person. Supervisors will use mechanical lifting equipment whenever possible to minimize worker exposure to lifting hazards.

4.3.4 Falling Objects

Raised items will be slowly lowered to the ground using a grapple and/or skip bucket or other heavy equipment. No personnel will work under equipment at any time. The SSHO will ensure that an adequate area is clear of personnel while the equipment is in operation. Dump truck drivers will remain in their trucks while soil and debris are placed in their trucks, if their trucks are equipped with a falling object protective structure (FOPS). If their trucks are not equipped with a FOPS, the drivers will exit their trucks and stand clear of the loading operation. Workers will not work under other workers who are on levels above them unless those levels have protection to prevent objects from falling on workers below.

4.3.5 Site Communication

At HPNS, TtEC has many systems for site communication. Daily safety meetings are presented to review planned work activities, and all site personnel are required to attend these meetings. All supervisors and managers have handheld radios. These radios are equipped with multiple channels to permit basewide communication, as well as individual work area communication. Additional radios are issued to equipment operators as determined by site supervisors. Supervisors and managers also have cell phones for communication. The antenna for radio communications and repeater stations ensure good communication throughout the site. As noted in the following paragraphs, personnel also receive training on the use of hand signals.

4.3.6 Heavy Equipment and Traffic

The use of heavy equipment for debris removal and lifting presents the greatest potential for injury to personnel. In order to minimize these hazards, the PjM and supervisor will designate routes for mobilization through the HPNS and establish specific traffic patterns. Trucks and heavy equipment will have spotters for backing maneuvers. Only qualified personnel will operate heavy equipment. Those crew members directly involved with spotting for the operator are the only personnel allowed in the vicinity of the heavy equipment. All others will remain a safe distance away from these operations.

All spotters who direct trucks and excavators must have training on how to conduct spotting in a safe manner. In addition to verbal and radio communications, all workers will be familiar with standard hand signals used on most projects. Common hand signals are shown on Figure 4-1. Additional hand signals that may be developed on-site will be added to this figure. Figure 4-1 will be posted on-site. Personnel needing to approach heavy equipment in operation will observe the following protocols:

- Make eye contact with the operator (and spotter)
- Signal the operator to cease heavy equipment activity
- Approach the equipment and inform the operator of intentions

TtEC personnel will follow all local traffic rules. Company vehicles will yield to bikes and pedestrians. Personnel working in areas subject to vehicular traffic (streets, parking lots, etc.) will wear high-visibility safety vests. Flashing light or reflectorized barricades will be used for roads that are blocked due to equipment. Coordinate traffic management issues with the Remedial Project Manager (RPM) and the Caretaker Site Office.

4.3.6.1 Site Pre-Inspection of Equipment

The projects will only use heavy equipment that is in safe working order. To maintain this policy, the project supervisor(s) and the equipment operator will inspect all equipment brought onto the project site for structural integrity, smooth operational performance, and proper functioning of all critical safety devices in accordance with the manufacturer's specifications and safety regulations. Prior to delivery, a competent person will inspect all equipment brought to the site and certify that equipment has been inspected and is safe to operate. A copy of this certificate will be given to a TtEC supervisor. There will be an operator's manual for each heavy equipment and vehicle. All equipment not conforming to the operational and safety requirements set forth during this inspection will not be put into service until all necessary repairs are made to the satisfaction of the inspection group.

4.3.6.2 Operator Qualifications

Only qualified operators familiar with the equipment to be used will be permitted to operate. Subcontractors will supply proof of their operator's capability and experience to operate the equipment in a safe manner. TtEC reserves the right to remove any operator from the project site if there is doubt concerning the operator's capabilities. There are specific training requirements for industrial truck (forklift) operators and for crane operators. These requirements are specified in the TtEC EHS procedures and the U.S. Army Corps of Engineers EM 385-1-1 Safety and Health Requirements Manual. Cal-OSHA also has requirements for industrial truck and crane operator licensing.

4.3.7 Electrical Hazards

To prevent accidents caused by electric shock, the project SSHO will inspect electrical connections on a daily basis. The SSHO will shut down and lock out any equipment that is found to have frayed or loose connections until a qualified electrician is contacted and repairs are made. The equipment will be de-energized and tested before any electrical work is done. Equipment will be properly grounded prior to and during work. For outdoor use, ground fault circuit interrupters (GFCIs) will be installed for each circuit between the power source and tool. In the event that generators are used to supply power, these generators will contain GFCIs.

Requirements for electrical safety include:

- Electrical wiring and equipment will be listed by a nationally recognized testing laboratory (Underwriters Laboratories, Canadian Standards Association (US), and others).
- Live parts of wiring and equipment will be guarded to protect persons or objects from harm. Uninsulated live wires must be placed at various heights and distances from the ground and from buildings depending on the voltage carried by those lines.
- Transformer banks and high-voltage equipment will be protected from unauthorized access.
- A qualified electrician will perform all work on electrical power supplies and lines.
- Flexible cords (extension cords) will contain the number of conductors required for service plus a ground wire. Cords will be rated for hard usage (S, SE, SEO, SO, SOO, ST, STO, STOO). This rating is not required to be listed on the cord itself; check the wrapping or label that comes with the cord to assure that the cord meets this requirement. Flexible cords are not allowed to pass through doors, windows, or be placed on the ground where they are subject to being run over by vehicles. If flexible cords must pass through walls, the cords will be protected by bushings or fittings.
- Flexible cords must be inspected on each day of use. No splices or fraying are allowed.

- Flexible cords will not be secured with staples, hung from nails, or suspended by bare wire. Plastic tie straps, commonly used today, are acceptable.
- Bulbs in portable lamps must be protected by a substantial guard attached to the lamp holder handle.
- Circuit breaker panels, electrical transformers, and supply equipment must be labeled as to the voltage contained therein.
- Circuit breaker panels must be labeled as to what each breaker controls.
- Breaker panels and electrical panels must have a cover protecting any live exposed wires.
- At least a 30-inch clearance must be maintained on three sides of circuit breaker boxes, transformers, and electrical supply equipment so as to provide ready access to the equipment in the event of an emergency. A 36-inch clearance is required for higher voltages to ensure that adequate clearance is provided. TtEC requires a 36-inch clearance of all breaker boxes, etc.
- Circuit breaker boxes that are locked or kept in locked rooms must have a key readily available in the event of an emergency.

4.3.7.1 Portable Generators

Portable generators are used on many construction sites. Portable generators must meet the requirements for grounding as specified in the National Electrical Code (NEC) National Fire Protection Association 70. NEC 250-6 has certain exemptions for the grounding of portable and vehicle-mounted generators. Refer to EM 385-1-1, Section 11.D.01.b, Grounding (USACE 2008) for additional details. Portable generators will be operated in open air only where there is sufficient ventilation to prevent accumulation of exhaust gases including carbon monoxide.

4.3.7.2 Temporary Wiring

A qualified electrician will design temporary wiring. A qualified engineer will approve the design. The system will be tested as required by EM 385-1-1, Section 11. Temporary lighting will be protected by guards and will not be suspended by the wire. Exposed empty light sockets and broken bulbs are not permitted. Temporary lighting circuits will be separate from electrical tool circuits. Circuits will be labeled as "LIGHTS ONLY" or "TOOLS ONLY."

4.3.8 Control of Hazardous Energy (Lockout/Tagout)

EHS 6-4, Lockout/Tagout, establishes the TtEC Control of Hazardous Energy Program. This program applies to all TtEC operations, except as follows:

- Work on cord- and plug-connected electrical equipment where the plug is under the control of the employee performing the work
- Hot tap operations

• Work involving minor changes and adjustments to equipment during routine operations (such as small tooling adjustments)

Refer to details of this program in EHS 6-4. Details of methods used to control hazardous energy for a defined task must be documented in the AHA for that task.

4.3.9 Confined Space Entry

A confined space is any enclosed area having a limited means of egress where ventilation is not adequate to remove a toxic or flammable atmosphere or oxygen deficiency that may exist. Examples of confined spaces include, but are not limited to, the following: tanks, boilers, vessels, bins, manholes, tunnels, pipelines, underground utility vaults, or any open top space more than 4 feet in depth such as pits, tubes, trenches, or vessels.

EHS 6-1 outlines procedures in detail. No confined space entry is allowed per this plan. Personnel entry into trenches is not permitted by this plan. Prior to the start and during the conduct of the project, the PESM, the SSHO, and the project supervisor(s) will identify confined spaces or confined spaces created by the nature of the work. The SSHO will not allow entry into these spaces. If a confined space entry is part of the planned activities for a task within a SSHP, the SSHP will detail the confined space entry procedure and requirements. If a confined space requires entry after an SSHP has been approved but was not part of the original SSHP, the SSHP will be modified and approved per the amendment procedure described in this SSHP.

4.3.10 Fire and Explosion Hazards

Atmospheric testing with a combustible gas indicator must be performed to determine the potential for a flammable atmosphere. A hot work permit must be issued to control the presence of equipment or operations producing open flames or sparks. Hot work permits and procedures are addressed in EHS 6-5. Permits are issued by the SSHO or designee. The SSHO must establish a fire prevention and protection program by ensuring that flammable materials are properly stored and that safe work procedures and rules are followed. Smoking on a project site is permitted only in designated areas.

4.3.11 Overhead Electrical Hazards

Overhead power lines may present a hazard to equipment and personnel. To prevent equipment contact with power lines and to prevent arcing, adequate clearance must be maintained. For lines rated 50 kilovolt (kV) or below, the minimum clearance between the lines and any part of the crane or load will be 10 feet. For lines rated more than 50 kV, the minimum clearance between the lines and any part of the crane or load will be 10 feet plus 0.4 inch for each kV over 50 kV. TtEC requires a minimum clearance of 15 feet. All overhead lines must be identified as to whether or not they are energized if they impact any removal work activities.

4.3.12 Excavation Safety

Any excavation or trenching operation that is 4 feet or more in depth will be performed in accordance with EM 385-1-1 and EHS 6-3. A TtEC excavation permit must be completed by a competent person before excavation commences and at least each day thereafter. This permit requires daily inspections of the operation and adjacent areas. Specific situations addressed in these inspections are possible cave-ins, standing water in excavations, indications of failure of protective systems (benching, sloping, or shoring), hazardous atmospheres, and other hazardous conditions. If the competent person finds evidence of any of these situations, exposed employees will be removed from the hazardous area until the necessary precautions have been taken to ensure their safety. In addition to the excavation permit, for work in California, a Cal-OSHA Activity Notification Form for Holders of Annual Excavation Permits must be filed with Cal-OSHA for any excavation 5 feet or greater in depth into which workers will enter. TtEC has an annual permit (number 2013-906490) for excavations in the state of California. Also, the National One Call number 811 must be called and notified before any excavation work begins regardless of depth.

Exploratory techniques, such as "pot-holing," will be performed to ensure that any excavation near utilities can be performed safely. Dust suppression measures may include the use of a compound that will make the soil less likely to generate dust or the use of water. However, work procedures as soil is moved and especially as it is lifted and loaded must be performed in such a way as to minimize the generation of dust. For example, loaders dumping soil into a dump truck or a stockpile may have to lower the bucket as close as possible to the truck or stockpile before dumping to reduce the drop height of the soil and thereby reduce the amount of dust generated.

The following provides general requirements governing activities in and around excavations and trenches, as well as the requirements for the selection and use of protective systems:

- All excavations 20 feet or greater in depth below ground surface must be designed and approved by a registered professional engineer in the state of California.
- Surfaces surrounding open trenches and excavations will have all surface hazards removed.
- All utilities will be located and cleared prior to initiating digging. Public or facility utility groups will be used where possible for this purpose. In the absence of either, the SSHO will specify the procedures to be used to clear utilities in consultation with the PESM and PjM. When the excavation is open, utilities will be supported and protected from damage. Clearance and support methods will be documented on the daily inspection checklist. EM 385-1-1, Section 25, requires the installation of perimeter protective systems for all open excavations. Class I perimeter protection is the most protective and requires installation of fences and barricades, which would prevent members of the public (people other than workers) from entering or falling into the excavation. Consult the EM 385-1-1 for the types of protective system required for various situations.

- Where structural ramps are used for egress, they will be installed in accordance with 29 CFR 1926.651(c)(1).
- Stairways, ladders, or ramps will be provided as means of egress in all trenches 4 feet or more in depth. Travel distance will be no more than 25 feet between means of egress.
- Employees exposed to vehicular traffic will wear high-visibility vests.
- No employee will be permitted under loads being lifted or under loads being unloaded from vehicles.
- When vehicles and machinery are operating adjacent to excavations, warning systems such as stop logs or barricades will be used to prevent vehicles from entering the excavation or trench. In any case, vehicles, equipment, materials, and supplies will never be placed closer than 2 feet from the edge of any excavation. A professional engineer may have to calculate the distances of heavier equipment for placement away from the edge so as to prevent collapse of the excavation wall caused by the weight of the equipment.
- Scaling or barricades will be used to prevent rock and soils from falling on employees.
- Excavated and loose materials should be kept at least 3 feet from the edge of excavations but at a minimum of 2 feet from the edge of the excavation in accordance with OSHA requirements.
- Walkways or bridges with standard railing will be provided where employees cross over excavations or trenches.
- Barriers will be provided to prevent personnel from inadvertently falling into an excavation. Workers within 6 feet of the edge of the excavation must be protected by fall protection (guardrails or personal fall protection system) if the excavation is 6 feet or greater in depth.
- Elevating work platforms will be used during survey and sampling activities.

4.3.12.1 Hazardous Atmospheres

Where atmospheres containing less than 19.5 percent oxygen or other types of hazardous atmospheres may exist, the following requirements will be implemented:

- Atmospheric testing will be done prior to employees entering any area where hazardous atmospheres may exist. If oxygen levels are below 20.8 percent, the PESM will be contacted.
- Testing methods will be listed on the daily inspection checklist, and results documented daily in field logs.
- Control measures such as ventilation and PPE will be used to control employee exposure to hazardous atmospheres below published exposure limits.

- Ventilation will be used to control flammable and combustible vapors to below 10 percent of their lower explosive limit.
- Testing will be repeated as often as necessary to ensure safe levels of airborne contaminants.
- Emergency equipment will be provided and attended when the potential for a hazardous atmosphere exists. This equipment will include but will not be limited to emergency breathing apparatus, harnesses, lifelines, and basket stretchers. Required equipment will be listed on the daily inspection checklist and reviewed daily.

4.3.12.2 Protection from Water Hazards

When water has collected or is collected in excavations and trenches, the following requirements will be applied:

- Employees will not work in excavations in which water has, or is, accumulating without the use of additional protection such as special support systems or water removal
- A competent person will monitor water removal.
- Barriers such as ditches and dikes will be used to divert runoff from excavations and trenches.
- Trenches will be re-inspected prior to re-entry after water accumulation due to heavy rainfall or seepage.

4.3.12.3 Stability of Adjacent Structures

When excavating or trenching near an adjacent structure, the following practices will be implemented:

- Support systems such as shoring, bracing, or underpinning will be provided where the stability of buildings, walls, or other structures is endangered by excavation.
- Excavation of bases or footings of foundations will be prohibited unless support systems are used, the excavation is in stable rock, a professional engineer has determined that the structure is sufficiently removed from the site as to not pose a hazard, or a professional engineer determines that the excavation will not pose a hazard to employees due to the structure.
- Support systems will be used when it is necessary to undermine sidewalks, pavements, and appurtenant structures.
- Surcharge load sources and adjacent encumbrances will be listed with their evaluation date on the daily inspection checklist.

4.3.12.4 Daily Inspections

Inspections will be performed daily on all excavations, adjacent areas, and protective systems before personnel enter the trench. The checklist provided in the EHS procedure or equivalent will be used.

4.3.12.5 Soil Classification

To perform soil classification, the competent person will use a thumb test, pocket penetrometer, or shear vane to determine the unconfined compressive strength of the soils being excavated. In soils with properties that change (one soil type mixed with another within a given area), several tests may be necessary. When different soil types are present, the overall classification will be that of the type with the lowest unconfined compressive strength. Classifications will result in a soil rating of Stable Rock, Type A, Type B, or Type C in accordance with 29 CFR 1926.652, Appendix A. Soil classifications will be listed on the daily inspection checklist. The soils analysis checklist provided in the EHS procedure or equivalent will be used for soil classifications.

4.3.12.6 Sloping and Benching

All sloping and benching will be done in accordance with 29 CFR 1926.652, Appendix B. Selection of the sloping method and evaluation of surface surcharge loads will be made by a competent person familiar with the requirements contained therein. Sloping and benching methods and specifications will be listed on the daily inspection checklist.

4.3.12.7 Protective Systems

Protective systems are required on all excavations over 5 feet in depth or in excavations less than 5 feet when examination of the ground by a competent person reveals conditions that may result in cave-ins. Selection and installation of protective systems will be done in accordance with 29 CFR 1926.652, Appendices C and D, or manufacturers' data for shoring and shielding systems. Selection of a protective system will be based on soil classification and job requirements by a competent person. Protective systems and specifications will be listed on the daily inspection checklist. Protective systems, as discussed here, refer to protective systems within the excavation itself and not to the perimeter protective systems as mentioned above.

4.3.12.8 Training

Competent persons will have an adequate combination of experience and training to classify soil types and select protective systems as outlined in 29 CFR 1926.652. Training and experience pertaining to qualification as a competent person will be documented and include the following:

- General safety practices related to working in or near open excavations
- Inspection requirements and techniques

- Classification of soils in accordance with 29 CFR 1926.652, Appendix A
- Uses, limitations, and specifications of protective systems in accordance with 29 CFR 1926.652

Training records will be maintained in accordance with EHS 1-9, Recordkeeping.

4.3.13 Operation of RSY

The RSY is constructed using plastic sheeting and straw bales (or other materials) to build berms. When potentially contaminated soil is brought to the RSY, the soil may be placed into a stockpile or the soil may be spread out on the surface of the screening pad. An excavator or skidster is used to spread the material out on the screening pads in lifts of approximately 6 inches in height prior to surface surveying. A towed array consisting of radioactivity sensors is used to survey the spread-out soil. The array is towed by a general purpose vehicle such as a Mule ™. The vehicle must drive slowly over the soil surface to accurately detect low-level radioactivity. At no time will the excavator and the towed array operate in the same screening pad at the same time. Based on the results of the towed array, additional soil samples in addition to the required 18 systematic samples will be collected.

For any areas indicating radioactivity greater than the release criteria, an excavator will be used to remove this material down to a depth of 6 inches and direct load it into low-level radioactive waste bins provided by the DON's low-level radioactive waste disposal contractor. Once the soil on the screening pad meets the release criteria detailed in the Sampling and Analysis Plan (TtEC 2013), the soil will be loaded into dump trucks with a loader or excavator and then stockpiled for reuse as backfill for the trenches or for off-site disposal by the DON's non-low-level radioactive waste disposal contractor. The operation of the heavy equipment requires that spotters maintain contact with the operator and that spotters are aware of the swing radius of the excavator.

All spotters who direct trucks and the excavator must have training on how to conduct spotting in a safe manner. In addition to verbal and radio communications, all workers should be familiar with standard hand signals used on most projects. Common hand signals are shown on Figure 4-1. Additional hand signals that may be developed on-site should be added to this figure. Figure 4-1 should be posted on-site.

4.3.14 Stockpile Management

Stockpiles need to be maintained during excavation activities; as such, they will be covered with a plastic liner or other material to prevent wind and rain erosion. Sandbags will be used to prevent wind from removing the plastic covers from over the stockpiles. Sandbags are heavy and workers will be instructed to follow safe lifting procedures. Sandbags will weigh no more than 35 pounds each (wet). The plastic liner can be slippery and is a hazard, especially if the plastic is wet. When the stockpiles are to be either used for backfilling or disposed of, the plastic must be removed. Workers will handle the plastic carefully so that the wind does not pick up the plastic

and whip the plastic around them. Any stockpile that is covered must have obvious surface hazard debris and trip hazards removed before placing the cover on top of the stockpile. The slope of a stockpile cannot exceed 1:1 (45 degrees). As an alternative to plastic and sandbags, a spray on soil stabilizer may be used to limit wind and rain erosion. All manufacturer PPE and application recommendations will be followed.

4.4 RADIATION

Radioactive materials were used and tested in the past at HPNS. Many areas and buildings at HPNS may have low-level radioactive contamination or debris that has low-level radioactivity. The purpose of this project is to remove pipes that may contain low-level radioactivity and adjacent soil that may have radioactive contamination. Work in these areas is performed under a Nuclear Regulatory Commission license. It is anticipated that only low-level radioactive materials or sources will be encountered.

Survey protocols will be prepared for each work activity and will be incorporated within the Execution Plan (TtEC 2013). All work at HPNS that involves surveying, sampling, and handling of materials that may have radioactivity is performed in accordance with the Basewide Radiological Management Plan (TtEC 2012). This plan is augmented by this SSHP to incorporate other hazardous components of the work as described, including additional hazards related to chemical characteristics of the materials in addition to any hazard related to the radioactive hazards that may be present.

4.5 ASPHALT PAVING

Asphalt paving uses specialized equipment for the application of hot asphalt to a prepared surface. There are many hazards associated with the use of this equipment. Hazards associated with this process are further described in AHA 5 provided in Appendix A of the APP.

4.6 ASPHALT RECYCLING

Asphalt recycling uses specialized equipment to grind the removed asphalt for subsequent reuse in the final course during backfill of areas not requiring asphalt paving. There are many hazards associated with the use of this equipment. Hazards associated with this process are further described in AHA 2 provided in Appendix A of the APP.

5.0 ACTIVITY HAZARD ANALYSES

An AHA is developed for each planned activity and operation occurring in each major phase of work. The AHA identifies the sequence of work, specific hazards anticipated, and the control measures to be implemented to minimize or eliminate each hazard. This AHA is used to augment daily safety meetings intended to heighten safety and hazard awareness on the job. This pretask briefing will be documented and may be combined with the daily tailgate safety meeting. AHAs are the focal point for safe conduct of work on a project. Since each task is described and evaluated, workers should be better prepared to perform work safely. In summary, the AHA will be covered during the Preparatory Phase Meeting of all definable tasks in the planned work. This will be documented in the Daily Contractor Quality Control Report as having been covered in the preparatory inspection meeting.

The SSHO will discuss the risks and precautions associated with each task identified in the Work Plan. Daily "tailgate" safety meetings are held at the start of each shift. Prior to the day's remediation activity, the safety meeting discusses the potential chemical, physical, and environmental hazards, and preventive safety measures. During a workday, if there are any changes or new conditions, the SSHO will ensure that the AHA is updated and that workers review the amended AHA. Attendance is mandatory for all employees involved in the specific work. Amended AHAs must be reviewed by the PESM. If a change must be implemented immediately, and the PESM cannot be contacted, the SSHO may implement the change and forward a copy of the change to the PESM as soon as possible and leave a voice mail phone message for the PESM.

If there are changes required due to changing conditions or requirements, the SSHP may be modified by preparing a Field Change Request (FCR) (see also Section 14.1).

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6.0 PERSONAL PROTECTIVE EQUIPMENT

PPE for site workers will be selected and used based on the known and anticipated potential hazards at the site according to the requirements of 29 CFR 1910.120 (8 CCR 5192). The specific work tasks to be performed will dictate the PPE provided to the workers. The selection of PPE requires an evaluation of chemical contaminants, concentrations of these chemical contaminants, and physical hazards that may be encountered.

The initial PPE for this project will be a standard work uniform consisting of long work pants, long-sleeved work shirt, hard hat, safety glasses, steel-toe or other protective boots that meet American Society for Testing and Materials requirements for foot protection, and work gloves as needed. As additional testing, monitoring, and background information become available, the SSHO may adjust the action levels and PPE accordingly. If dust is generated, the SSHO may recommend the use of half-face dust masks that comply with National Institute for Occupational Safety and Health N-95 approval. During the excavation and sewer removal, there is a possibility that visibly contaminated soil, buried containers, or odors will be noted. In this case, all work in the area where the conditions are noted will stop. The SSHO will contact the PESM (CIH) to discuss the conditions, and the CIH will recommend the protective equipment required to perform monitoring and/or sampling. After the monitoring, the SSHO, the Superintendent, and the CIH will determine whether work can continue in the area. If work is allowed to continue, the CIH will specify the level of protection required for workers in the area. In some cases, work in a specific area may have to be stopped and the area covered until sample analysis is completed and results are evaluated by the CIH.

This SSHP complies with 29 CFR 1910.132 (8 CCR 3380 through 3390), which states that PPE for eyes, face, head, and extremities, protective clothing, respiratory protection devices, and protective shields and barriers will be provided, used, and maintained in a sanitary and reliable condition. PPE is required wherever it is necessary by reason of hazards from processes or environment, chemical hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact.

Respiratory protection is of primary importance in the protection of employee health since inhalation of air contaminants is a potential major route of exposure. The TtEC respiratory protection program is administered pursuant to the requirements established by 29 CFR 1910.134 (8 CCR 5144). The SSHO is assigned responsibility as the Respirator Program Administrator for the project. Selection, use, and maintenance of PPE at the project will be in accordance with EHS 5-1 (Personal Protective Equipment) and 5-2 (Respiratory Protection). The SSHO may upgrade or downgrade the level of protection based on the anticipated hazard,

evaluation of site monitoring data, and the action levels established by the SSHP and with the concurrence of the PESM.

For site work under this contract, TtEC and its subcontractors will maintain protective equipment on-site for use by government visitors as specified in the CTO.

7.0 AIR, NOISE, AND OTHER MONITORING

The SSHO will conduct monitoring to ensure that each site worker is adequately protected. Site monitoring and sampling includes real-time air monitoring, perimeter monitoring, radiation monitoring, noise monitoring, and heat stress monitoring. Depending on contaminants identified, the PESM may advise that personal air samples are collected.

The SSHO will have experience using the required monitoring or sampling equipment. The PESM will ensure that each SSHO is qualified to operate all assigned instruments. The SSHO will ensure that each piece of equipment is properly maintained and calibrated.

Ambient air monitoring will be conducted during excavation and operations to determine airborne contamination levels.

7.1 DIRECT READING INSTRUMENTS

7.1.1 Photoionization Detector

A photoionization detector (PID) (10.6 electron volt [eV] lamp) and/or a flame ionization detector (FID), will be used to determine the presence and concentration of organic vapors. Contaminants such as volatile petroleum hydrocarbons and benzene are detectable with the PID. The FID would be required to detect some halogenated hydrocarbons.

Instrument: PID (10.6 eV) or FID

Action Level: 10 parts per million (ppm) in breathing zone

Action: Stop work and notify PESM

7.1.2 Combustible Gas Meter/Oxygen/Carbon Monoxide/Hydrogen Sulfide Meter

A multi-sensor meter will be used to screen for the presence of flammable vapors, oxygen (O_2) deficient and O_2 enriched atmospheres, carbon monoxide, and hydrogen sulfide. If flammable vapors are at 10 percent of the lower explosive limit (LEL) or greater, work will cease and the area will be allowed to ventilate. If O_2 levels below 20.8 percent or above 22 percent are encountered, personnel will leave the area and the area will be ventilated.

Instrument: Multi-sensor gas meter

Action Level: 10 percent \geq LEL, \leq 20.8 percent O_2 or \geq 22 percent O_2

Action: Stop work, ventilate, and notify PESM.

Sensor: Hydrogen sulfide

Action Level: 5 ppm (At no time can the level exceed 20 ppm.)

Action: Stop work, ventilate, and notify PESM.

Sensor: Carbon monoxide

Action Level: 10 ppm

Action: Stop work, ventilate, and notify PESM.

7.1.3 Particulate Monitor

A MiniRAM Monitor Model PDM-3 or equivalent will be used to measure respirable airborne particulates measuring between 0.1 to 10 micrometers. The MiniRAM will be used as an indicator of total ambient dust in the work area and will serve to monitor when additional dust control is required. Worst-case scenarios can be assessed for the purpose of establishing a total dust action level by using half of the TLV of respirable dust as the action level.

Instrument: MiniRAM Aerosol Monitor Model PDM-3 or equivalent

Action Level: 0.5 milligram per cubic meter for perimeter of work area (level chosen to

minimize overall permissible dust release from site)

Action: Implement dust control procedures.

If dust cannot be reduced below the specified concentration, respiratory protection will be required, which will consist of a full-face air-purifying respirator and P-100 cartridges.

7.1.4 Noise Monitoring

A noise survey meter will be used to measure the noise levels in the work area and at the work perimeter. The results will be recorded in the logbook. Workers will adhere to procedures found in EHS 4-4, Hearing Conservation. Employees will use hearing-protective plugs or muffs whenever levels are greater than 84 dBA. Levels consistently over 85 dBA will be reported to the PESM to determine if additional monitoring with dosimetry equipment will be conducted and additional noise controls will be instituted.

7.1.5 Radiation

Radiation monitoring procedures, action levels, and recordkeeping will be in accordance with the Basewide Radiological Management Plan (TtEC 2012).

7.1.6 Heat Stress

Heat stress monitoring is used to estimate workloads and establish work/rest times based on 1) Wet Bulb Globe Temperature (WBGT) instrumentation and calculations, 2) monitoring physiological conditions and adjusting work/rest periods, or 3) using personnel heat stress monitors. Attachment B of EHS 4-6, Temperature Extremes, describes the monitoring procedures in detail. Heat stress evaluation and physiological monitoring will be performed for all work requiring impermeable clothing (coveralls) for Level C protection. At a minimum, workers wearing permeable clothing will be physiologically monitored whenever temperatures exceed 70°F and work-rest schedules require modification from the established tables.

Otherwise the WBGT Index will be used to establish work rest schedules as outlined in the EHS procedure.

7.2 MONITORING STRATEGY

7.2.1 Personnel

Background levels will be measured with the PID before any work commences. Monitoring of the area will begin by taking background readings. The PID will be used wherever odors are detected and will continue to be used until odors can no longer be detected and organic vapor levels are below 5 ppm. The PID will also be used whenever there is visible contamination in excavated soil and when buried containers are discovered. In consultation with the PESM, the SSHO will determine if further actions and/or measurements are warranted to prevent or minimize exposure of personnel. It is essential that odors and measurable levels of organic vapors be limited to the exclusion zone. Similarly, suspected contamination will be assessed by approaching from a safe area to the area of concern.

The multi-sensor gas meter will be used continuously inside any building whenever fuel-powered equipment is operating.

7.2.2 Perimeter

Dust levels will be monitored with the MiniRAM at the perimeter of the site, downwind of active removal activities. All levels above background will be immediately reported to the PESM, who will evaluate the results.

7.3 QUALITY ASSURANCE/QUALITY CONTROL

Adherence to a quality assurance/quality control plan is essential for a meaningful air sampling effort. The major concerns of a quality assurance/quality control plan are equipment calibration and document control.

7.3.1 Calibration and Maintenance Procedures

All direct reading instruments will be calibrated daily, or before and after each use. Calibration records will be kept detailing the date, time, span gas or other standard, and the name of the person performing the calibration. The calibration gas for the PID is isobutylene. The SSHO will ensure that the instrument is kept clean and will follow manufacturer's directions for keeping the lamp clean. The SSHO will not perform any other maintenance procedures unless approved by the PESM.

The calibration gas for the multi-sensor gas meter is usually a methane/air or a hexane/air mixture. O_2 is calibrated against normal air in a clean environment. A low O_2 calibration gas can be used for calibrating the response of the O_2 sensor. Often, 100 percent nitrogen is used to "zero" the O_2 sensor. For this plan, calibration of the explosimeter means a daily field check

with known calibration gases. The reading on the instrument must be within 3 percent of the stated value of the gas. If it is not, then formal calibration of the instrument must follow the manufacturer's calibration procedure.

The MiniRAM requires factory calibration annually. It cannot be field calibrated. However, the zero value of the instrument must be checked daily. If the zero value exceeds the manufacturer's recommended value, the instrument must be cleaned. The instrument's zero is reset by following the manufacturer's instructions.

7.3.2 Documentation

Strict adherence to document and data control procedures is essential for good quality assurance/quality control. Data and calibration records must be accounted for and be retrievable at all times. Types of documents that are essential include notes, logbooks, maps, data sheets, equipment calibration logs, and reports. These must be placed in the project files. Copies of all field data reports and personal sampling records will be sent to the PESM for review.

The SSHO will ensure that all data are documented in logs or logbooks including calibration data, types of calibrants used, the manufacturer and model number of instruments used, the date and time of the calibration and monitoring events, the area or personnel monitored, the atmospheric conditions and weather, unique site conditions, equipment operating in area, initials of individuals performing the monitoring, and any other information that affects the data or the actions taken based on the data.

8.0 SITE CONTROL

The PjM, Project Superintendent, and the SSHO will implement site control measures at each work location. General site control measures pertain to the overall site and may include the use of security guards, perimeter fencing, sirens, posting of warning signs, and illumination. These control measures are geared toward visitors and the general public. Location-specific control measures are designed to control contamination and worker entry and egress from individual work areas.

8.1 EXCLUSION ZONE

The exclusion zone may include all areas within the boundaries of a contaminated work area or merely the areas immediately surrounding the site of intrusive activity. Access points are provided to the exclusion zone. During activities where the possibility of airborne contaminants being carried outside the exclusion zone exists, the exclusion zone will be expanded to include areas of possible contamination. Only designated project team members and authorized government agency personnel will be allowed in the exclusion zone. All personnel entering the exclusion zone must wear the appropriate level of protection designated for the work area and must sign in and out of the work area. Personnel must also meet medical surveillance requirements, training requirements, and respirator fit test requirements. All personnel exiting the exclusion zone must be fully decontaminated in the contamination reduction zone.

8.2 CONTAMINATION REDUCTION ZONE

All personnel and equipment that may have been contaminated in the exclusion zone will be subject to decontamination in the contamination reduction zone. Temporary or field decontamination stations for personnel and equipment will also be located in the contamination reduction zone as needed. The contamination reduction zone is intended to be a buffer between the exclusion zone and the support zone and will be designed to prevent the transfer of contaminants from the exclusion zone to the support zone and off-site locations. A contamination reduction corridor (CRC) is usually located within this zone. Workers will find decontamination equipment, supplies, and stations in the CRC.

8.2.1 Decontamination Procedures

Personal hygiene practices for field personnel are described in the APP. At a minimum, site workers will be provided with adequate restroom and hand washing facilities and be required to wash exposed areas of the skin (hands, arms, and face) upon exiting potentially contaminated areas. Smoking, eating, or drinking will not be allowed in exclusion zone or contamination reduction zone work areas.

The SSHO will train site personnel in the steps used for decontamination. The SSHO will periodically inspect for compliance with decontamination procedures and correct any deficiencies.

Separate areas will be designated for equipment decontamination and personnel decontamination. These areas will be separated to minimize contamination of the personnel in the contamination reduction zone by overspray from equipment decontamination.

8.2.2 Personnel Decontamination

This project will require only the simple brushing off of the work uniform prior to leaving the contamination reduction zone. If, during the course of the project, contaminants are identified that require a greater level of protection and subsequent decontamination of the workers, this plan will be modified to identify the appropriate decontamination procedure. As required by the Radiological Control Plan, all workers leaving the exclusion zone are also scanned for radiation before they are permitted to leave that zone.

Personnel departing the exclusion zone are required to proceed through a decontamination line. If more than a simple brushing off of work clothing and boots is required, a decontamination procedure will be followed. The following decontamination procedure is an example, which will be modified as needed for each specific work location:

- Facility 1—Segregated Equipment Drop: Drop equipment onto plastic liner or shelf.
- Facility 2—Boot Cover Wash/Rinse and Removal: Wash and rinse outer boot covers
 with detergent and water. Remove boot covers and discard into proper container for
 disposal.
- Facility 3—Boot Wash/Rinse, Outer Suit Wash/Rinse and Removal: Wash and rinse protective suits. Wash and rinse safety boots. Remove and discard outer suit and place into disposal containers.
- **Facility 4**—Outer Glove Wash/Rinse and Removal: Wash and rinse outer gloves. Remove and discard into disposal container, leaving inner gloves on.
- **Facility 5**—Respirator Removal: Decontaminate, remove, and sanitize respirator and backpack assembly. Place on the table.
- **Facility 6**—Remove Boots and Inner Gloves: Remove boots, then inner gloves. Discard inner gloves.
- Facility 7—Field Wash: Wash hands, arms, and face with water.

In case of an emergency, gross decontamination procedures will be implemented and the person will be transported to the nearest medical facility immediately at the direction of the SSHO according to the Site Emergency Response Plan (Section 12.0). The medical facility will be informed that the injured person is on the way, and has not been fully decontaminated. The

medical facilities will be notified of the potential chemicals present and of the exposureprevention measures that can be used while treating the victim.

A commercial vendor may launder reusable protective clothing (cotton overalls). If the coveralls are contaminated with a hazardous waste, the vendor will be notified in writing of the type of waste.

8.2.3 Equipment Decontamination

Heavy equipment, PPE, monitoring equipment, and sampling equipment may require decontamination. Procedures may be modified based on actual site conditions. Depending on the nature of the contaminant, seats and flooring of equipment and vehicles entering an exclusion zone may need to be covered with disposable plastic such as polyethylene.

Decontamination of heavy equipment (including under carriage, chassis, and cab) will be performed using a high-pressure washer sprayer, and/or steam cleaner and may include appropriate biodegradable solvents. All equipment will be decontaminated on a preconstructed decontamination pad designed to collect and store washings. The equipment will first be sprayed and scrubbed with water (and a low-sudsing detergent as required). Secondly, the equipment will be rinsed with water. If persistent contamination exists after cleaning based on visual assessment, other cleaning methods may be necessary. Air filters on equipment used in the exclusion zone will be removed and disposed with the materials used for decontamination if warranted. Depending on the contaminants, a simple scraping and brushing off of the equipment may be acceptable.

Outer PPE, if used, (such as protective suits, boot covers, and outer gloves) will be washed and rinsed with trisodium phosphate and water if reuse is anticipated. If they have become grossly contaminated during work operations, they will be changed as necessary during the day. Respirators, if used, will be sanitized by rinsing in a germicidal rinse followed by a clean water rinse, then air-dried in a clean area.

Each person will be responsible for the decontamination of his or her own respirators at the end of each shift.

Reasonable precautions will be taken to minimize monitoring equipment contamination. Decontamination will be accomplished using materials that will not damage the instrument(s). Delicate air monitoring and surveying equipment will be wiped off with alcohol or soap and water and protected from contamination when in use.

Sampling equipment used for chemical tests will be cleaned following procedures specified in the Sampling and Analysis Plan (TtEC 2013).

If decontamination pads are used, they will be constructed to facilitate containment and collection of all potentially contaminated water and decontamination fluids. The waste liquids will be transferred to appropriate drums, holding facilities, or waste systems. All PPE wastes generated will be bagged, labeled, and stored for off-site disposal or incorporation into other waste materials. TtEC will store waste in a manner and in an area designated by the facility. In no case will storage exceed 90 days from the start date of accumulation of the waste. Some facilities require that storage not exceed a period of time less than 90 days (45 days). Each PjM will ensure that the specific requirements of the facility are followed.

8.3 SUPPORT ZONE

When locating and arranging the main support zone, consideration will be given to accessibility, utility availability, wind direction, and line-of-sight to work. Included in this area will be the main office trailer, administration area, vehicle parking, security, toilets, water, electricity, and a break/lunch area. The main support zone is located well away from the work areas. An auxiliary support zone will be the area where support workers will provide assistance to workers inside the exclusion zone and contamination reduction zone. The support zone normally will begin at the exit from the decontamination line. Only appropriately containerized material, clean equipment, and decontaminated personnel can enter the support zone from the contamination reduction zone.

9.0 MEDICAL SURVEILLANCE PROCEDURES

TtEC requires that site workers participate in a medical surveillance program that meets the requirements of 29 CFR 1910.120(f) (8 CCR 5192). The medical surveillance program, managed by the TtEC medical consultant, a Board Certified Physician in Occupational Medicine, will be instituted for the following employees:

- Employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year
- Employees who wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134 (8 CCR 5144)
- Employees who are injured, become ill, or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation

The medical surveillance program is described in EHS 4-5, Medical Screening and Surveillance.

9.1 MEDICAL CLEARANCE

Workers who must enter exclusion zones or who meet the criteria listed above must provide the SSHO with a written opinion from a licensed physician attesting to the employee's fitness for duty at a hazardous waste site. A physician's written opinion of the employee's ability to wear a respirator also will be required when there is a reasonable possibility that a respirator may be required for site work. The physician's written opinion must be dated within the previous 12-month period, or an alternate time period as determined by the physician, for continued work. No special or additional biological monitoring, testing procedures, or immunizations are required for this project.

9.2 HEPATITIS A IMMUNIZATIONS

Since this project involves work with sewer lines including sanitary sewer lines, all workers working on this project will be offered an opportunity to receive vaccinations for Hepatitis A. This vaccination is a series of two shots and will be offered to employees at no cost. At the beginning of the project, TtEC may arrange for the vaccinations to be provided by its medical clinic at the job site.

9.3 RECORDKEEPING

The SSHO will maintain a file for each person on-site. This file will contain a copy of the physician's statement of the employee's fitness for duty, the employee's ability to wear a respirator, and the employee's work restrictions if there are any. The SSHO will ensure that the employee and project supervisors comply with medical work restrictions, if any. The SSHO will also ask each employee to complete a form to indicate all known allergies, prescription medications, and any other medical information that will allow the SSHO to respond to any medical emergency in an appropriate manner. Personnel will notify the SSHO regarding any medications, including over-the-counter, they are using on each day of work. The SSHO, in consultation with the PESM and/or a medical consultant, will determine if any medications may have an effect on a worker that would impair the ability of the worker to perform work safely. At no time will the SSHO maintain the copy of any actual medical records. These records are maintained by the TtEC medical consultant.

10.0 SAFETY CONSIDERATIONS

All workers must comply with the TtEC Project Rules Handbook. The following are some of these rules.

The following practices will be expressly forbidden during field operations:

- Entrance onto the site or into a designated restricted area without formal authorization, without compliance with medical monitoring and training requirements, and/or without compliance with this SSHP.
- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material in any area designated as contaminated.
- Approach or entries into areas or spaces where toxic or explosive concentrations of gases, vapors, or dusts exist without prior approval of the SSHO and/or use of PPE.
- Facial hair that interferes with the satisfactory fit of the mask-to-face seal of respirators is prohibited for personnel required to wear respiratory protection equipment.
- The use/wearing of personal stereo headphones. Their use may preclude reception of audible warning signals and/or hazard communication. Also, cell phones cannot be used during work hours unless an employee is on break or the cell phone is used only for job-related purposes. Cell phones will not be used at any time workers are driving or operating any equipment or using any tools or mechanical devices.

The following practices are required:

- Personnel and equipment in the contaminated area will be minimized, consistent with effective site operations.
- Equipment will be bonded, grounded, spark-proof, and explosion resistant, as appropriate, to minimize or prevent the ignition or flammable materials in the work zone.
- A minimum of two employees, in constant communication (either visual or voice) with each other, will be required to perform any work within the exclusion zone.

10.1 VEHICLE AND EQUIPMENT OPERATIONS

Prior to the use of all vehicles and equipment, operators will conduct a safety inspection and record the findings in the Safety Inspection Equipment Checklist. Dust suppressants will be used to the extent possible for controlling airborne dust generation. In addition, vehicular traffic speed on unpaved roads will be restricted to 15 miles per hour. Motor vehicles and material handling equipment assigned to this site will conform to the requirements of 29 CFR 1926.601 and 1926.602 (8 CCR 1590 through 1596). Crews using personnel transport vehicles to and

from the work site will use the vehicle's safety belts. Drivers of vehicles will be responsible for passenger use of the safety belts. Personnel are not allowed to ride in the bed of pickup trucks unless there is an approved restraint system installed and used.

The Project Superintendent is responsible for maintaining a clean job site, free from hazards, and for providing safe access and egress from the site. Traffic cones and/or high-visibility barrier tape will be used, where appropriate, for traffic control into/out of hazardous or restricted areas. Personnel will wear reflective, high-visibility safety vests or clothing whenever working in and around vehicles and on roads and job sites.

Other requirements include:

- Whenever the operator leaves the operator's position, the equipment will be turned off, unless the equipment must be kept running to perform required maintenance or safety inspection. If the equipment must be kept running, the operator will ensure that the equipment cannot move by placing it in "park," by setting the emergency brake or another type of brake, by placing blades or pans to the ground, or by using any other manufacturer-recommended method to keep the vehicle from moving.
- Blades and buckets on heavy equipment will be lowered during transport. Blades and buckets will be placed on the ground whenever the operator leaves the machine.
- Construction equipment (heavy equipment) has the right-of-way in field activities.
- All heavy equipment will have a reverse signal alarm (90 dBA) that operates automatically with backward movement.
- All equipment will have brakes and brake lights. Equipment operated in hours of darkness must have operating headlights.
- Personnel will not ride on or be on any equipment while it is in motion unless there is a seat or stand designed for a person to occupy that has restraints such as approved seatbelts.
- Seatbelts and restraints will be used at all times when any equipment is in motion.

10.2 ADDITIONAL SAFETY CONSIDERATIONS

The following is a list of precautions to minimize the possibility of injury occurring during field operations.

10.2.1 General Information

- Be your brother's keeper. Consider what you do in terms of the hazard it may create for others.
- Ask the SSHO if you do not know how or have doubt as to the safe way of doing your job.
- No running at any time, except in extreme emergencies.

- Throwing any object at personnel or equipment is prohibited.
- Minimum requirements on construction sites and in shop are long pants, a shirt with the shoulders covered, and good work shoes. Torn, ragged, or frayed items should not be worn because they can catch on obstructions or machine parts, or otherwise cause trips or falls.
- Know where emergency exits are and how to get to them. Do not block them with material or equipment.

10.2.2 Housekeeping

- Clean work areas and storage areas encourage better incident prevention, and make the work easier to do.
- Dispose of trash and scrap in proper containers. This includes lunch papers, soft drink cans, banding straps, wood, rags, paper cups, etc.
- Keep tools, material, and equipment stored in an orderly manner, and in their proper places. This prevents unnecessary damage and helps workers to find them when they are needed.
- Keep stored material, scrap, and other tripping hazards out of roads and walkways and away from emergency equipment. If it is in a walkway and it is not moving, it does not belong there.
- Cords, cables, and hoses crossing roads or walkways are to be covered to prevent tripping or damage or are to be supported overhead. If supported overhead, they must be at least 7 feet above walkways and 14 feet above roads.

10.2.3 Fire Prevention

- Control "open flame" tools and equipment.
- Protect nearby combustible materials from heat, flames, sparks, and slag by moving or covering them.
- Keep flammables in closed containers. Use safety cans.
- All site workers will have training on the use of portable fire extinguishers.

10.2.4 Personal Protective Equipment

- Head Hard hats are required at all times on construction sites. They are also required at other locations where overhead hazards exist. Bump hats are not permitted.
- Eyes and Face Spectacle-type safety glasses are required when hitting steel on steel, grinding, drilling, sawing, or vibrating concrete, and so forth, or when working near someone else who is creating flying particles. Safety goggles may be required when a tight seal around the eyes is needed, i.e., winds cause dust to become airborne.
- Boots Workers will wear hard-toe (steel or composite that meets OSHA requirements) boots (not shoes). Boots must be at least ankle-high and have a steel or

- composite shank and non-slip sole. They must be constructed of leather or other chemically resistive material. Suede and cloth are not acceptable.
- Safety Vests For the protection of workers, and to make workers more visible, most safety plans require that workers wear high visibility safety vests. Personnel working near roads or other places where there is vehicular traffic must wear high-visibility vests as required by code. These vests must have reflective tape during hours of darkness
- Fall Protection A safety harness and a fall restraint system, such as a lanyard attached to an approved support point, are required when working from any support or surface where the possibility of falls exists, or where guardrails are not installed. Tie off to a solid, approved support. Tie off as short as possible, allowing no more than 36 inches for a fall

10.2.5 Hand Tools

- Every tool is designed for a specific use. Avoid misuse and inspect daily for defects.
- Keep tools in proper working condition (clean, sharp, oiled, dressed, and adjusted).
- Mushroomed chisels and drills cause dangerous flying objects. Keep them dressed.
- Never hit hardened steel with hardened steel, such as hitting a hatchet with a hammer.
- Do not use "cheaters" to increase capacity. Get a larger tool.
- Carry tools in a proper sheath, belt bag, or box with points down.
- Do not carry pointed or sharp tools in pockets.
- Eye protection is required for protection from flying particles.
- Do not use damaged tools; mark and tag them as out of service. Give damaged tools to the Project Superintendent or SSHO.

10.2.6 Power Tools

- Know how to shut it off before turning it on. No locked "on" switches on hand-held power tools.
- Eye protection is required for protection from flying particles. Hearing protection must be made available if needed.
- Power-activated tools will be inspected daily before use for proper operation of their safety devices. You must be authorized by your foreman to operate this equipment.
- Power tools designed to accommodate guards will have guards installed and functioning prior to use.
- Power supply must be properly attached to tool and to source. Electric tools must be grounded (or "double insulated").
- Check area for other people before starting tool. Warn people nearby.
- Be prepared for jamming of rotating tools. Have sure footing, good balance, and watch out for nearby obstructions. Check yourself for loose clothing.

- Shut off and bleed pressure from air hoses before disconnecting air tools. Never point an air hose toward another person or yourself.
- Power tools must be GFCI-protected or double-insulated.
- Avoid using power tools in wet locations. Air-powered tools may be used.
- Protect all cords and plugs from damage. Ensure that the power cord is well away from the operating portion of the power tool.
- Power tools must be turned off before disconnecting them from the power source. If a circuit breaker is tripped or the tool stops operating, turn off the power switch before disconnecting the power source.
- Disconnect power cords from the source before coiling.
- Refer to Section 4.3.7 regarding the use of extension cords.
- Unplug electric cords.
- Store cords in a safe place when not in use. Protect them from weather, dirt, and water.

10.2.7 Material Hoists

- Do not use material hoists for hoisting people.
- Secure material to prevent it from shifting.
- Use tag lines.
- Ensure that rigging is performed by a person competent in rigging techniques.
- Inspect all rigging before use.

10.2.8 Forklifts

- You must be authorized by your supervisor before operating a forklift.
- Keep forks spread as far apart as possible. Check the stability of the load before moving it.
- Look in the direction of travel before and during moving. Watch out for overhead hazards
- Back down grades when carrying a load.
- No riders are allowed unless a passenger seat is provided.
- Forks are not to be used as an elevator or a work platform.
- Lower forks all the way down before leaving the equipment.
- Do not drive along the edge of raised docks, platforms, or ramps.
- In California, operating rules must be posted.

10.2.9 Mechanical Material Handling

• Know the weight of the load to be moved.

- Know the capacity of the equipment to be used to move the load.
- Use tag lines to control the load. Keep tag lines free of your body and free of obstructions during movement of the load.

10.2.10 Manual Material Handling

- Leg muscles are stronger than back muscles. Lift with your legs, not your back. To make a smooth, controlled lift, bend the knees, keep the back straight, tighten the abdomen, and use the legs.
- Plan before you lift. Consider the weight, size, shape, path of travel, and set-down location. Get help if necessary.
- Protect your hands and fingers from rough edges, sharp corners, and metal straps. Keep hands and fingers out of pinch points between the load and other objects.

10.2.11 Overhead Work

- No one is to be unprotected under overhead work.
- Erect barricades, signs, or other devices to warn people of the overhead work. Respect the barricades or signs installed by others.
- Covered walkways are needed where people must pass under overhead work.

10.2.12 Portable Ladders

- General All Portable Ladders
 - Inspect for defects. When defects are found, immediately withdraw the ladder from use. Set the ladder feet on a solid foundation.
 - Only one person is allowed on a ladder at one time.
 - Use ladders for climbing, not for material skids, walkways, or work benches.
 - Face the ladder while climbing up or down, and while working from it. Use a safety harness or fall protection when falls are possible.
 - Both hands are needed for climbing. Use a hand line for material.
 - No metal ladders are to be used.
 - Store ladders safely to prevent damage from vehicles, materials, and so forth.

• Straight and Extension Ladders

- Correct slope of a ladder is 1H:4V.
- Secure the ladder from slipping. Use non-slip feet on the bottom, and tie off with a rope at the top.
- Extend the ladder 3 feet above the top landing when the ladder is to be used for access to the landing.
- Extension ladders cannot exceed 30 feet.
- Do not take extension ladders apart to get two ladders.

 Keep hands off rungs while extending or lowering an extension section. Be sure latches are in place before climbing.

Stepladders

- Open fully. Lock spreaders. Do not use as a straight ladder.
- Do not stand or step on the top platform.
- Keep loose tools off steps and the top platform.
- Tie off the stepladder if it is longer than 12 feet.
- Stepladders cannot exceed 20 feet in height.

10.2.13 Compressed Gas Cylinders

- Always keep cylinders upright. Tie them off vertically with strong wire, rope, or chain, or keep chained in cylinder cart.
- Do not drop or roll the cylinders.
- Use a rack for lifting cylinders to and from upper elevations. Never lift a cylinder by the control valve or a valve cover.
- Always replace valve covers when gauges are removed. Valve covers must be placed on all cylinders before they are moved.
- Store oxygen cylinders 20 feet away from other cylinders or separate by a solid approved divider. Do not store cylinders inside a building.
- Keep oil and grease away from oxygen valves.
- Cylinders are to be kept at a safe distance or shielded from welding and cutting operations. They are not to be placed where they can contact an electric circuit.
- Acetylene cylinders must always be stored upright.
- Use only regulators specifically approved for the type of gas in the cylinder (read the front of the gauges for this information). Never modify regulators or use adapters.

10.2.14 Welding and Burning

- Electric
 - Obtain a hot work permit.
 - Keep leads out of walkways.
 - Shield arcs to protect others from direct arc rays.
 - Wear proper shade number of protective lenses (welding goggles or helmet).
 - Remove the rod from the electrode holder before laying it down. Put rod butts in a container, not on the floor.
 - Proper grounding from work to machine is a must.
 - Turn off the machine at end of shift.

Gas

- Obtain a hot work permit.
- Keep hoses out of walkways.
- Wear proper shade number of protective lenses (welding goggles or helmet).
- Check the area around and below for possible fire hazards.
- Remove gauges at the end of the shift and replace the cap on the cylinder.
 Use toolboxes to store hose and ventilate gauges.
- Use soapy water when checking for leaks.
- Before using fuel gas cylinders:
 - Always crack the cylinder valve before connecting gauges to clear dirt.
 - Open the cylinder valve slowly and leave the wrench in position while the cylinder is in use.
 - A regulator will always be used on fuel gas cylinders.
 - The cylinder valve will always be closed before removing regulator.
 - When a fuel gas cylinder connected to gauges leaks, it will be repaired or removed from service and taken away from the work area.

10.2.15 Electricity

- Refer to Section 4.3.7 for additional details on electrical safety.
- All electrical work will be performed by qualified persons familiar with the NEC and other applicable codes.
- Temporary lighting circuits require guards over the bulbs. Metal guards must be grounded. Live electrical work requires a permit from the ROICC and an FCR to ensure that arc flash protection methods are employed.
- Keep extension cords out of water and at least 7 feet above walkways.
- Disconnect switches must be labeled to show the equipment or service they feed. Check before operating.
- Always shut down electrical equipment before servicing, repairing, or investigating questionable function.

10.2.16 Decontamination

- Personnel
 - Do not walk through areas of obvious or known contamination.
 - Do not handle or touch contaminated materials directly.
 - Make sure PPE is free of cuts or tears prior to donning.
 - Fasten all closures on suits. Cover with tape, if necessary.

- Particular care should be taken to protect from any skin injuries.
- Do not carry cigarettes or gum into contaminated areas.
- Heavy Equipment
 - Take care to limit the amount of contamination that comes in contact with heavy equipment.
 - If contaminated tools are to be placed on noncontaminated equipment for transport to the decontamination pad, use plastic to keep the equipment clean.

10.2.17 Illumination

All outdoor work must be performed during daylight hours (half hour after sunrise to half hour before sunset). If work must be performed during hours of darkness or inside buildings, the project will ensure that additional lighting is provided to meet the requirements of 29 CFR 1926.56 (8 CCR 3317). Work inside buildings requires illumination as specified in this plan.

10.3 ERGONOMIC CONSIDERATIONS

Routine activities at the project may involve tasks that, by their nature, may subject personnel to unexpected ergonomic stresses. Examples of ergonomic stresses include:

- Muscular sprains and strains
- Musculoskeletal trauma from impacts or vibrations
- Fatigue due to extended work schedules

Caution and workload awareness should be exercised by all site personnel during project activities. Tasks which involve manual manipulation of sampling devices, chemical storage drums, shoveling, or prolonged exposure to vibrating mechanical equipment should be monitored by the individuals involved with them to preclude the adverse effects of ergonomic stress. Tasks should be rotated among the workers to minimize the effects of repetitive trauma.

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11.0 WASTE MANAGEMENT

The management of wastes will comply with Attachment 6 (Waste Management Plan) of the Execution Plan (TtEC 2013). Section 6.0 describes the handling of wastes from the project site and the management of all decontamination liquids and disposable clothing and supplies that have come in contact with contaminated materials. All disposable PPE will be treated as contaminated waste and disposed of properly. Wastewater generated on-site will be stored until ready for testing and disposal. All waste containers will be properly labeled and stored in a manner consistent with regulatory requirements. Contents of the containers will be sampled by trained sample technicians and possibly sent to a laboratory to determine regulatory permitted disposal methods. Decontamination water will be contained and captured using submersible pumps and/or vacuum units.

For this CTO, all low-level radioactive waste will be transferred to the DON's low-level radioactive waste disposal contractor. All radiologically cleared excavated soil that cannot be reused as backfill and radiologically cleared debris will be stockpiled for subsequent off-site disposal by the Navy's non-low-level radioactive waste disposal contractor. TtEC will arrange for the proper disposal of all decontamination fluids per contract requirements. For TtEC contracted transport and disposal operations, the project personnel will only use transport and disposal facilities that have been preapproved by an internal review process in accordance with TtEC's policies and procedures.

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12.0 EMERGENCY RESPONSE PLAN

There are numerous emergency services nearby in the civilian community. This plan describes response activities as they apply to HPNS.

12.1 RESPONSIBILITIES

The Project Superintendent or PjM is the primary emergency coordinator for the project. In the absence of either or both the Project Superintendent and the PjM, the SSHO is the emergency coordinator. The emergency coordinator will take charge and determine, direct, and delegate personnel and resources to manage the emergency. Key responsibilities of the emergency coordinator are to:

- Initiate evacuation, if needed.
- Initiate emergency response agency notification.
- Evaluate and assess emergency situations to ensure that response activities are commensurate with the level of the emergency and, as discussed in this plan, are implemented.
- Interface and coordinate with outside agencies responding to on-site emergencies.

12.2 COMMUNICATIONS

Personnel will maintain verbal communication. The following communication systems will be available during site activities:

- Cellular telephone or access to a land phone for emergency purposes
- Hand-held radios, as needed
- Compressed air horn (signals emergency evacuation only)
- Hand signals (if used, will be diagrammed and posted)
- Posted location of evacuation assembly area(s)
- Posted route to the hospital located nearest the project site
- Posted emergency phone numbers

12.3 ACCIDENT/INCIDENT REPORT

After the emergency event is over, or during the course of the emergency when possible, the SSHO will notify the PESM by telephone. Should an accident or incident occur, the Superintendent or PjM and the SSHO will immediately investigate the cause, notify the PESM, and promptly complete the following:

- Incident Report Form Details of the incident will be documented within 24 hours and copies of the report will be forwarded to the DON RPM and the PESM. Reports of serious incidents will also be faxed to the PM by the Superintendent or PjM.
- Incident Investigation Report The Incident Investigation Report will have the same distribution as the Incident Report Form within 3 days of the incident.
- Contractor's Significant Incident Report If the accident/incident involves injuries requiring more than first aid or property damage greater than \$2,000, a Contractor Significant Incident Report will be prepared and submitted to the ROICC as soon as possible after the incident. The originals will be sent to the TtEC records coordinator for maintenance and distribution by TtEC. Copies will be distributed to the PESM, Superintendent, subcontractor employees, if appropriate, and the DON Contracting Officer. A copy of the completed forms will be kept in the project file.
- Contractor Incident Reporting System (CIRS) report (refer to the APP Section 7.0).

Any recommended additional hazard control measures must be discussed with the Superintendent, SSHO, and PESM and meet their approval, prior to implementation. Any occupational injuries and illnesses will be recorded, if applicable, on an OSHA Form No. 300. The SSHO will report immediately to the PESM any serious injury or illness requiring hospitalization, or death of an employee occurring in a place of employment or in connection with any employment. The PESM will immediately notify the Cal-OSHA District Office in San Francisco, California at (415) 557-0100. Immediately means as soon as practically possible, but not longer than 8 hours after the incident. Records of all site accidents and first aid treatments will be maintained by the SSHO.

12.4 PRE-EMERGENCY PLANNING

Prior to performing any work, the Project Superintendent or PjM and the SSHO will verify emergency action plans by ensuring that planned support facilities are available and that emergency contact numbers are valid. As work proceeds, the SSHO will continue to ensure that plans specified in this section can be implemented at all times. Furthermore, the SSHO will ensure that plans are modified as necessary to accommodate changes. The SSHO will coordinate changes with the PESM. Upon arrival at the site, the Project Superintendent will ensure that personnel know the system for communication of emergency situations and how to use a radio or nearby phone to summon emergency assistance. A vehicle must be available to transport personnel to a safe location or to a hospital. All personnel on this project will know how to use a portable fire extinguisher. All personnel will know the location of emergency equipment and supplies. The SSHO will ensure that emergency equipment is available in the work areas and that the equipment is inspected for compliance with the regulations and TtEC policies:

- Fire extinguishers monthly, annual refill and servicing, 12-year hydro-test.
- First aid kits weekly as required by EM 385-1-1, Section 03.B.02 (USACE 2008) and Cal-OSHA 8 CCR 5812.

• Eyewashes – weekly (If preservative is used, eyewash water may be changed every 4 months; otherwise, water must be changed weekly.) (0.4 gallon per minute for 15 minutes). Only potable water may be used for eyewashes.

12.5 EMERGENCY MEDICAL TREATMENT

The following procedures should be observed if an accident with injury occurs.

12.5.1 First Aid

Only qualified personnel will provide first aid and stabilize an individual needing assistance. Life support techniques such as CPR and treatment of life-threatening problems such as airway obstruction and shock will be given top priority. At least two persons certified in first aid techniques and CPR will be on each work site at all times; EHS 4-1, Bloodborne Pathogens, will be followed when first aid/CPR are administered. The SSHO will be current in first aid and CPR and bloodborne pathogen training. Professional medical assistance will be obtained at the earliest possible opportunity. Ensure that WorkCare® has been contacted at (888) 449-7787. The hospital and clinic located nearest to HPNS are shown on a map that is part of every SSHP. A general map to the nearest clinic and hospitals is attached to this plan (Figure 12-1). Notify the PjM and the PESM.

12.5.2 Minor Injury

- Contact a supervisor or "buddy."
- Have qualified first aid personnel treat the injury.
- Record the injury and include the name of the injured person, nature of injury, and treatment given.
- Notify the PjM and the PESM.

12.5.3 Medical Emergency

In the event of a medical emergency when actual or suspected serious injury occurs, the following procedures will be implemented:

- Survey the scene and evaluate whether the area is safe for entry.
- Remove the exposed or injured person(s) from immediate danger.
- Render first aid if necessary. Decontaminate affected personnel after critical first aid is provided.
- Obtain paramedic services or ambulance transport to local hospital. This procedure will be followed even if there is no visible injury.
- Call 911 from phones on HPNS. Calling 911 from cell phones will notify California Highway Patrol who will notify county Emergency Medical Service. From cell phones, call (415) 861-8020. (This is an emergency phone number to be used from cell phones in San Francisco.)

- Identify the location by the number of the nearest building, request medical assistance, and provide a name and telephone number.
- Request assistance from emergency medical service and/or additional assistance.
- Other personnel in the work area will be evacuated to a safe distance until the Project Superintendent determines that it is safe for work to resume. If there is any doubt about the condition of the area, work will not commence until all hazard control issues are resolved
- Notify the PjM and the PESM.
- Notify the ROICC of the incident and fill out accident reporting forms and associated documents.

12.5.4 Fatal Injury

If a fatal injury occurs, the following additional steps will be followed:

- Notify the Project Superintendent and PiM immediately.
- Notify the PESM who will initiate contact with Cal-OSHA.
- Notify the ROICC.
- All work activities on the project must be stopped for 24 hours.
- Assist Cal-OSHA as directed.

12.6 DECONTAMINATION DURING MEDICAL EMERGENCIES

Any personnel requiring emergency medical attention will be evacuated immediately from exclusion and contamination reduction zones. Personnel will not enter the area to attempt a rescue if their own lives would be threatened. The decision whether or not to decontaminate a victim prior to evacuation is based on the type and severity of the illness or injury and the nature of the contaminant.

For some emergency victims, immediate decontamination may be an essential part of life saving first aid. For others, decontamination may aggravate the injury or delay lifesaving treatment. If decontamination does not interfere with essential treatment, it should be performed.

If decontamination can be performed:

- Wash external clothing and cut it away.
- Wrap the victim in a clean blanket or towel if necessary.

If decontamination cannot be performed:

- Wrap the victim in blankets or plastic to reduce contamination of other personnel.
- Alert emergency and off-site medical personnel to potential contamination; instruct them regarding specific decontamination procedures.
- Send along site personnel familiar with the incident.

12.7 EMERGENCY SITE EVACUATION PROCEDURES

In the event of an emergency situation such as fire or explosion, the SSHO or a supervisor will activate an air horn for approximately 15 seconds indicating the initiation of evacuation procedures. All personnel in both the restricted and unrestricted areas will evacuate and assemble near the support zone or other safe area identified by the SSHO. Prior to starting work, the SSHO will identify and mark the location of an evacuation assembly area. The location should be upwind of the site.

For efficient and safe site evacuation and assessment of the emergency situation, the Project Superintendent or SSHO will have authority to initiate proper action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SSHO must ensure that access is provided for emergency equipment and that equipment that may cause combustion has been shut down once the alarm has been sounded. As soon as possible, and while the safety of all personnel is confirmed, emergency agency notification will commence. The SSHO will brief site personnel each day as to the location of the evacuation assembly area. After gathering at the local site assembly point, and depending on the nature of the emergency, workers may be instructed to reassemble at TtEC's office trailers.

Before starting work, the SSHO will establish safe egress routes from the site to the evacuation assembly area. The SSHO will prepare a drawing or map that diagrams these safe egress routes. The SSHO will use this same map to diagram egress from the evacuation assembly area to the facility gate to be used as an exit (Figure 12-2). From this point, the map showing the route to the nearest clinic and hospitals (Figure 12-1) will be used if medical services are required.

An evacuation exercise will be practiced within 1 week of the start of the project, and randomly during the course of the project. After the practice drill or after any actual evacuation, all involved site personnel will attend a briefing to evaluate the evacuation. The employees will discuss the evacuation and anything that could be done to improve or change future evacuations. The results of this briefing will be documented on a safety meeting attendance form. A copy of the evaluation report will be sent to the PESM.

12.8 FIRE PREVENTION AND PROTECTION

Fire prevention and protection measures require preplanning. At least one dry chemical ABC fire extinguisher rated a minimum 6A:80BC will be located at each excavation site. A mounted fire extinguisher is required in every vehicle including heavy equipment. Extinguishers mounted on heavy equipment will be a minimum 10-BC dry chemical type. Fire extinguishers inside the cab of pickup trucks will be 1A:5 BC minimum. Fire extinguishers in the cabs of all vehicles must be mounted or secured. Fire extinguishers in the beds of all pickup trucks must be mounted or secured. Employees will follow safe work practices to include proper storage of flammable

and combustible liquids. Smoking is permitted only in those areas designated specifically by the PjM, Project Superintendent, or SSHO and posted as smoking areas.

Personnel will follow hot work procedures to ensure that work is performed in a safe environment. In the event of a fire or explosion, the Fire Department will be summoned immediately, a head count will be taken, and evacuation procedures will be implemented. Smoking is not permitted inside buildings. All hot work requires the use of a permit system described earlier in this SSHP.

12.9 SPILL CONTROL AND RESPONSE

All spills, leaks, and fires involving oil or hazardous substances at HPNS must be reported to the RPM and the PESM. The person reporting the leak or spill is required to provide the following information:

- His/her name
- Location of spill and facility number, if known
- Number of injured personnel and nature of injuries, if known
- Substance spilled
- Estimated amount spilled
- Extent of spill
- Estimated rate at which the substance is currently being released
- Estimated time the spill occurred
- Any other pertinent information

The RPM, in coordination with the PjM, will manage notifications to regulatory agencies. In addition, all spills will be reported to the TtEC Environmental Compliance Manager or the PESM. Project personnel will not report spills directly to any agency unless specifically requested by the RPM or Contracting Officer.

A minor spill involves no immediate threat to human health or the environment and minimal property damage, and does not exceed the reportable quantity for that material. In the event of a minor spill, the appropriate response action is for the responsible person to notify the RPM and the PjM and supply the responders with as much information as possible. In the case of a spill of contaminated or hazardous materials, the following procedures will be followed:

- Notify the Project Superintendent, the PjM, and the PESM.
- Identify protective clothing or equipment required to respond.
- Contain the spill.

- Neutralize and/or solidify any product.
- Transfer material into 55-gallon drums.
- Document the incident.

12.9.1 Release Prevention and Minimization Measures

In addition to training, the following procedures will be implemented to prevent and minimize releases of hazardous materials:

- Do not conduct hazardous materials operations when the weather could cause significant risk to the surrounding area if a spill should occur.
- Transfer all materials in or over a bermed or "protected" area. A protected area is one that is covered with an impermeable material, such as polyethylene.
- Dike temporary storage tanks containing hazardous wastes or potentially hazardous wastes to contain potential releases.
- Maintain a supply of basic spill response materials and protective equipment on-site to include:
 - Absorbent sheets, pillows, booms, or absorbent material
 - Open-top 55-gallon drums or other containers with lids
 - Brooms, shovels, and other tools, such as squeegees

12.10 SIGNIFICANT VAPOR RELEASE

Any project activity that releases significant amounts of vapor must be reported immediately, as described in the spill release procedure. Every attempt to mitigate the release must be taken if it can be safely performed. For example, during excavations, vapor releases may be controlled by simply replacing the cover on the excavation. Downwind evacuation procedures may be required. These will be initiated through coordination with HPNS emergency coordinators.

12.11 EARTHQUAKE RESPONSE

If an earthquake should occur during the course of site activities, take the following action:

- Stop working. Remain calm and do not panic.
- Do not use or do anything that might be a source of ignition (smoking, cutting, or welding).
- Avoid power lines, power poles, and windows.
- If in a vehicle, stay in the vehicle until the earthquake is over.
- If in a building, take cover under a heavy piece of furniture or leave the building if possible. Buildings at HPNS have not been maintained and many of them are subject to collapse in an earthquake.

After the earthquake is over:

- Prepare for aftershocks. Stay out of severely damaged buildings.
- Meet for a head count at a location designated by the Project Superintendent.
- Check for injuries. Do not move seriously injured personnel, unless remaining where they are would create danger of further injury.
- Check vehicles, equipment, and buildings for any obvious damage. Do not enter buildings until their structural integrity has been evaluated.
- Check utility lines for damage. Switch off power, water and gas until a utility official has inspected the buildings and operational area and determined it is safe.
- If driving, watch carefully for hazards created by the earthquake (undermined roads, weak bridges or overpasses, fallen power lines or poles, and so forth).

12.12 EMERGENCY EQUIPMENT

The following emergency equipment will be stationed near each work area:

- Fire extinguisher (minimum one 6A:80B:C type in the CRC at the edge of exclusion zone or in the area of the radiological survey teams).
- Industrial first aid kit (in the CRC, at the edge of the support zone or in the area of the radiological survey teams). The kit must be filled as required by EM 385-1-1, Table 3-1 (USACE 2008) and 8 CCR 5812.
- Portable eye wash (capable of supplying 15 minutes of water at 0.4 gallon per minute and protected from direct sunlight in the support area, at the edge of the support zone or in the area of the radiological survey teams).
- Air horn (at the support area, at the edge of the support zone).
- Spill control material (absorbent pillows or absorbent material and shovels, plastic sheeting, and 55-gallon drum[s] in the support zone by the CRC entrance).

The following equipment will be available at the support trailer for use in an emergency situation:

- Industrial first aid kit
- Blanket

12.13 EMERGENCY INFORMATION POSTINGS

Emergency contact names and phone numbers will be posted (Table 12-1). A map showing egress routes, evacuation assembly areas, and the route to the clinic and hospitals will also be posted (Figures 12-1 and 12-2). The contact names, phone numbers, and maps will be placed on the dashboard of every project vehicle.

13.0 TRAINING

In accordance with TtEC corporate policy and pursuant to 29 CFR 1910.120 (8 CCR 5192), hazardous waste site workers will, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for HAZWOPER, unless excepted by the above reference. At a minimum, the training will have consisted of instruction in the topics outlined in the above reference. Personnel who have not met the requirements for initial training will not be allowed to work in any site activities that may expose them to chemical or physical hazards. Subject to PESM approval, an employee's prior experience and/or training for equivalency may be considered to meet the training described above.

In addition to the required initial training, each employee will have received 3 days of directly supervised on-the-job training at a hazardous waste site. This training will have addressed the duties the employees are expected to perform and be properly documented. The TtEC Project Superintendent has the responsibility for ensuring that personnel assigned to field sites comply with these requirements. The Project Superintendent will provide the DON Contracting Officer or designee with written certification of completion of the required training and maintain copies of required training records at the work site.

13.1 MANAGER/SUPERVISOR TRAINING

In accordance with 29 CFR 1910.120 (8 CCR 5192), on-site managers and supervisors who are directly responsible for, or who supervise employees engaged in hazardous waste operations, will receive training as required above and at least 8 additional hours of specialized training on managing such operations by the time of job assignment.

13.2 ANNUAL 8-HOUR REFRESHER TRAINING

Annual 8-hour refresher training will be required of all hazardous waste site field personnel to maintain their qualifications for fieldwork. The following topics will be reviewed: toxicology, respiratory protection, medical surveillance, decontamination procedures, and personal protective clothing. In addition, topics deemed necessary by the SSHO or PESM may be added to the above list.

13.3 SITE-SPECIFIC TRAINING

Prior to beginning field activities, the SSHO will provide site-specific training to the personnel assigned to the site. This training will specifically address the activities, procedures, monitoring, and equipment for the site operations. Training also will address site and facility layout, hazards and hazard communication, and emergency services at the site, and will highlight the provisions contained within the SSHP. This training also will allow workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and health for their particular

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activity. If determined necessary while the fieldwork is underway, additional training will be identified and provided.

13.4 RADIATION WORKER TRAINING AND RADIATION AWARENESS TRAINING

Workers that perform radiation-related work under a Nuclear Regulatory Commission license are required to have specific training as required under that license. This training is specified in the license. The SSHO will review training records to ensure that all workers required to have this training have documentation in their training records.

All workers at HPNS will receive, at a minimum, radiation awareness training. This training will address the types of radioactivity that could be expected, the hazards associated with radiation and corresponding protective measures, and what should be done if suspicious objects or known radioactive materials are encountered. This training will be documented in each employee's training record.

13.5 ASBESTOS AND LEAD AWARENESS TRAINING

HPNS has many buildings and areas that have asbestos-containing materials and, at a minimum, lead-based paint. Since work will be conducted adjacent to these buildings and there is a potential to uncover buried building debris, all workers at HPNS must receive asbestos awareness training and lead awareness training prior to performing any work activity at HPNS. TtEC has prepared training on each subject. The course is usually presented by the SSHO. Documentation of this training must be in each employee's training record.

13.6 ON-SITE SAFETY BRIEFINGS

Project personnel and visitors will be given daily on-site health and safety briefings by the SSHO, or designee, to assist site personnel in safely conducting their work activities. This training will be conducted prior to the start of new work activities using AHAs. The briefings will include information on new operations to be conducted, changes in work practices, or changes in site environmental conditions. The briefings also will provide a forum to facilitate conformance with safety requirements, and identify performance deficiencies related to safety during daily activities or as a result of safety inspections. As specified earlier in this plan, the SSHO and a supervisor will conduct a safety survey prior to the survey activities in each work area. The hazards identified during the safety survey will be discussed with the personnel performing the work.

13.7 FIRST AID AND CPR

The SSHO will identify those individuals requiring first aid and CPR training. At a minimum, the SSHO will have received first aid and CPR training. At least two persons trained and current in certification of first aid and CPR will be present at every work site. The training will be

consistent with the requirements of the American Red Cross Association or other nationally recognized organization. All personnel trained in first aid and CPR also will receive annual training in the bloodborne pathogen standard.

14.0 LOGS, REPORTS, AND RECORDKEEPING

The following is a summary of required health and safety logs, reports, and recordkeeping.

14.1 SITE HEALTH AND SAFETY PLAN CHANGES

An FCR form will be completed and submitted for all changes to the SSHP, as specified in the Remedial Action Contract Program Quality Control and Quality Assurance Program. PESM approval is required of all FCRs that affect the site safety programs.

14.2 MEDICAL AND TRAINING RECORDS

Full medical and training records are normally kept by the employer. Proof of the most recent training and medical qualification must be provided to the SSHO by the employee. The SSHO will maintain a file containing appropriate training and medical qualifications for all site workers including subcontractors. Medical records will be maintained in accordance with 29 CFR 1910.20 (8 CCR 3204). The examining physician retains custody of the complete medical record. Employee records include only the physician statement of medical qualification for duty and the employee's fitness to wear a respirator.

14.3 ON-SITE LOG

A log of personnel (including job title, level of protection, and work location) will be kept on-site each day by the SSHO or designee. Originals will be kept in the project file.

14.4 HEALTH AND SAFETY FIELD LOGBOOKS

The SSHO will maintain either daily logbooks at the site as specified in HSG 2-2, Logbooks, or a form prepared for submission with the site daily report. The logbook or form will be used to document important events as they occur. Some general procedures will pertain to the use of all logbooks or forms. The following information will be recorded on each page of the logbook or form:

- Initials of persons making entry
- Date
- Time of each entry (military time)
- Location

The logbook or form will be signed at the end of each day or work shift. All entries will be made in black ink. Corrections will be made with a single line through the entry, and initialed.

The logbook or form will be used to record daily site conditions and activities, and will contain the following items:

- Names and job titles of personnel in the work group
- Level of protection
- Health and safety monitoring equipment used
- Weather conditions
- Work/rest schedule (if appropriate)
- Description of the activities as they are occurring
- Any pertinent health and safety observations
- Sample number (if appropriate)

Copies of the logbooks, checklists, and inspection forms will be submitted to the Project Superintendent as necessary. The original logbooks will become part of the exposure records file and will be maintained by the TtEC records coordinator. The prepared form used in lieu of the logbook will be submitted with the daily report.

14.5 EXPOSURE RECORDS

Personal monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept in accordance with 29 CFR 1910.20 (8 CCR 3204). For TtEC employees, the originals will be sent to the records coordinator. For subcontractor employees, the originals will be sent to the subcontractor employer and a copy will be kept in the project file.

14.6 ACCIDENT/INCIDENT REPORTS

A TtEC accident/incident report must be completed following any event involving emergency first aid, lost time, or property damage. The originals will be sent to the TtEC records coordinator for maintenance and distribution by TtEC. Copies will be distributed to the PESM, Project Superintendent, and subcontractor employees, if appropriate. A copy of the completed forms will be kept in the project file.

14.7 OSHA FORM 300

An OSHA Form 300 (Log of Occupational Injuries and Illnesses) will be kept at the project site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the TtEC records coordinator for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA Form 300. The TtEC accident/incident report meets the requirements of the OSHA Form 301 (Supplemental Record) and must be maintained with the OSHA Form 300 for all recordable injuries or illnesses.

14.8 HEALTH AND SAFETY FIELD INSPECTIONS

The SSHO will conduct daily safety and health inspections and maintain a written log, which includes:

- Area/operation inspected
- Date of inspection
- Identified hazards
- Recommended corrective actions
- Estimated and actual dates of corrections

The safety inspection logs will be attached to the Contractor's Daily Production/Quality Control Reports. The Daily Safety and Health Report form is located in Appendix A.

14.9 MATERIAL SAFETY DATA SHEETS/SAFETY DATA SHEETS

The SSHO will maintain an MSDS/SDS on file at the project site for each hazardous chemical that is on-site. An MSDS/SDS for each contaminant will also be maintained on file. New SDSs are expected to be released gradually by manufacturers until the new GHS standard is fully implemented in 2016.

14.10 CLOSEOUT SAFETY REPORT

A final closeout safety report will be provided to the PESM summarizing the safety performance achieved during the site work. Specific elements of the report will include the following:

- A description of significant events, exposures, accidents, illnesses, and actions taken to prevent their occurrence
- A summary of monitoring results including air, noise, radiation, and heat stress samples
- A description of any state or federal inspections involving the health and safety of site workers

14.11 REQUIRED POSTINGS

- Department of Labor:
 - 1. Minimum Wage
 - 2. Polygraph Protection Act
 - 3. Equal Employment Opportunity
 - 4. Job Safety and Health
 - 5. Family Leave
 - 6. Uniformed Services Employment and Reemployment Rights Act

- Cal-OSHA and California Department of Industrial Relations:
 - 1. Safety and Health Protection on the Job
 - 2. Discrimination in Employment
 - 3. California Workers Compensation (Sign begins: "If a work injury occurs...")
 - 4. Emergency Phone Numbers
 - 5. Notice of Unemployment and Disability Insurance
 - 6. Access to Medical and Exposure Records
 - 7. Hearing Protection Standard
 - 8. For sites where radioactive materials are used or stored (Ni-63 in electron capture detectors, density meters such as Troxler):
 - 1) Standard for Protection Against Radiation
 - 2) Notice: Current Copy of Radiation Control Regulations and Radiation Control Officer
 - 9. California Law also requires a posting of which day is payday and a multipage document regarding minimum wage.
 - 10. Operating Rules for Forklifts, if forklifts are used on project
 - 11. California's Accident and Injury Illness Prevention Program: A Management Policy on Health and Safety
 - 12. Whistle Blower Protection
- Contract Requirements Postings:
 - 1. Hotline Poster
 - 2. Drug Policy Poster
 - 3. Prevailing Wages
- TtEC Required Postings:
 - 1. Policy on Sexual Harassment
 - 2. Policy on Equal Employment Opportunity
 - 3. Accident/Injury Reporting
 - 4. Recycling and Use Double Sides Posters
 - 5. TtEC ZIP® Poster
 - 6. TtEC Work Rules

15.0 FIELD PERSONNEL REVIEW

All personnel are required to be trained in this SSHP. Upon completion of this training and review, all project personnel will acknowledge this training by signing a review form acknowledging training in this plan.

16.0 REFERENCES

- ACGIH (American Conference on Governmental Industrial Hygienists). Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices. Most current publication.
- DON (Department of the Navy). 2006. Department of the Navy Environmental Restoration Program Manual. August.

TtEC (Tetra Tech EC, Inc.). Corporate Health and Safety Program Manual. Most recent issue.
———. Project Rules Handbook. Most recent issue.
———. 2012. Basewide Radiological Management Plan, Hunters Point Naval Shipyard, San Francisco, California. February 3.
———. 2013. Execution Plan, Parcel E Sanitary Sewer and Storm Drain Radiological

- Remediation and Support, Hunters Point Naval Shipyard, San Francisco, California. November.
- USACE (U.S. Army Corps of Engineers). 2008. U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1. September 15. Consolidated August 2011.
- U.S. Department of Health and Human Services. 1985. Occupational Safety and Health Guidance for Hazardous Waste Site Activities.

Note: Where no date is given in the references above, it is assumed that the reference used will be the most recent publication. Specific references unique to a project will either be listed as an attachment to the SSHP or they will be incorporated as a separate section to the SSHP. For example, a specific procedure for personal air sampling may be included as a reference within the SSHP.

TABLES

TABLE 12-1

EMERGENCY INFORMATION

REPORT ALL FIRES, SERIOUS INJURY, OR UNCONTROLLED SPILLS IMMEDIATELY: 911 or (415) 861-8020 (from cell phone)

Clinic	From the corner of Galvez A gate. (The Innes Avenue ga	.m. – 6:00 p.m. (Monday – Fr Avenue and Donahue Street, gate is the only open gate to HPs and bear right onto Hunters	riday) go toward the main PNS.) Once on Innes,
	Continue on Hunters Point Boulevard, which becomes Evans. Continue on Evans and turn right at 3rd Street. Continue on 3rd Street, past Cesar Chavez until 16th Street. Turn left, and continue to Connecticut Street. Clinic is on the left.		
Hospital: San Francisco General or Saint Luke's Hospital	San Francisco General Hosp 1001 Potrero Avenue San Francisco, CA 94110	pital (415) 206-8	000
	Saint Luke's Hospital 3555 Cesar Chavez San Francisco, CA 94110	(415) 647-8	600
	From the corner of Galvez Avenue and Donahue Street, go toward the main gate. (The Innes Avenue gate is the only open gate to HPNS.) Once on Innes, continue northwest on Innes and bear right on to Hunters Point Boulevard. Continue on Hunters Point Boulevard, which becomes Evans. Continue on Evans and turn right at 3rd Street. Continue to Cesar Chavez. Turn left onto Cesar Chavez. Continue west under the 280 Freeway and continue under the 101 Freeway. Turn right on Potrero to reach SF General. Continue on Potrero. Hospital will be on the right on 23rd Street. For St Luke's continue on Cesar Chavez. Hospital will be on left at the corner of Valencia Street.		
TtEC Medical Provider	WorkCare® (888) 449-778	R7 Call for all medical relate	ed cases, 24/7.
Fire/EMS/San Francisco	911 – Emergencies	Cell Phone: (41	15) 861-8020
Police		ne do not go directly to Hi California State Highway on-Emergency	
Hunters Point Police Patrol	(415) 559-9848 cell		
All site work	ers contact a superintendent	or a manager in an emergen	ncy.
TtEC Project Superintendents and Field Engineers	Dennis McWade (PS) (415) 216-2761 office (580) 670-0292 cell	Chris Hanif (PS) (415) 216-2762 office (510) 967-1710 cell	Andrew Gorman (FE) (415) 216-2737 office (425) 241-0713 cell

TABLE 12-1

EMERGENCY INFORMATION

m.n.c.cv. n. 4			1
TtEC Site Project Manager	Bill Dougherty (PjM)	Jeff Bray (Asst. PjM)	
	(415) 216-2731 office (415) 238-7006 cell	(415) 216-2774 office (415) 515-2648 cell	
m.n.c.p. vi v · · · ·	` ′	(713) 313-2040 CCII	
TtEC Radiological Screening	Shanti Montgomery		
Yard Manager	(415) 216-2772 office (360) 320-8519 cell		
TUDG D. H. d. G. A.	` '	E 1 A11 : (BCO)	
TtEC Radiation Safety	Jeff Ambrose (RSOR) (415) 216-2758 office	Erik Abkemeier (RSO) CHP, PE, CSP	
	(509) 260-1144 cell	(757) 944-0921 cell	
TtEC Haalth & Safate.	Dan Keenan, CSP	Andrew Gorman	
TtEC Health & Safety	(SHM/SSHO)	(Alternate SSHO)	
	(415) 216-2750 office	(415) 216-2737 office	
	(415) 272-1015 cell	(425) 241-0713 cell	
TtEC Environmental &	Richard Kanaya (PQCM)		
Quality Control	(415) 216-2759 office		
	(415) 516-9583 cell		
TtEC Program Managers	Andrew Bolt, PE (PM)	Greg Joyce (QC)	Roger Margotto, CIH
	(619) 471-3511 office	(360) 780-0371 cell	(PESM)
	(360) 908-0359 cell		(619) 471-3503 office
			(619) 988-0520 cell
TtEC Corporate Health	Erik Abkemeier, CHP, PE, CSP		
Physics Manager	(757) 944-0921 cell		
NIA VIVI DDM	,	Catharina Harry	
NAVY RPM	Chris Yantos (619) 532-0912 office	Catherine Haran (619) 532-0787	
	,	· /	
NAVY CSO	Doug DeLong	Mel Asuncion	
	(415) 743-4729 office (510) 772-8832 cell	(415) 743-4721 office (510) 772-7639 cell	
	(310) //2-8832 cell	(310) //2-/039 cell	
NAVY ROICC	Shirley Ng	Andrew Uehisa	
	(510) 521-8713 office	(510) 521-8742 office	
	(510) 755-5878 cell	(510) 755-5875 cell	
National Poison Control	(800) 222-1222		
Center	(000) 222-1222		
National Response Center	(800) 424-8802		
RCRA Hotline	(800) 424-9346		
SF ICE #	(415) 861-8020 (SFPD alternate emergency number)		
	<u> </u>		

Abbreviations and Acronyms:

CHP – Certified Health Physicist

CIH – Certified Industrial Hygienist CSO – Caretaker Site Office CSP – Certified Safety Professional EMS – Emergency Medical Services

FE – Field Engineer

HPNS – Hunters Point Naval Shipyard

TABLE 12-1

EMERGENCY INFORMATION

Abbreviations and Acronyms (Continued):

ICE – in case of emergency

PE – Professional Engineer

PESM - Project Environmental and Safety Manager

PjM - Project Manager

PM – Program Manager

PS – Project Superintendent

QC – Quality Control

RCRA – Resource Conservation and Recovery Act

ROICC – Resident Officer in Charge of Construction

RPM - Remedial Project Manager

RSO - Radiation Safety Officer

RSOR - Radiological Safety Officer Representative

SF - San Francisco

SFPD – San Francisco Police Department

SHM - Safety and Health Manager

SSHO – Site Safety and Health Officer

TtEC - Tetra Tech EC, Inc.

FIGURES

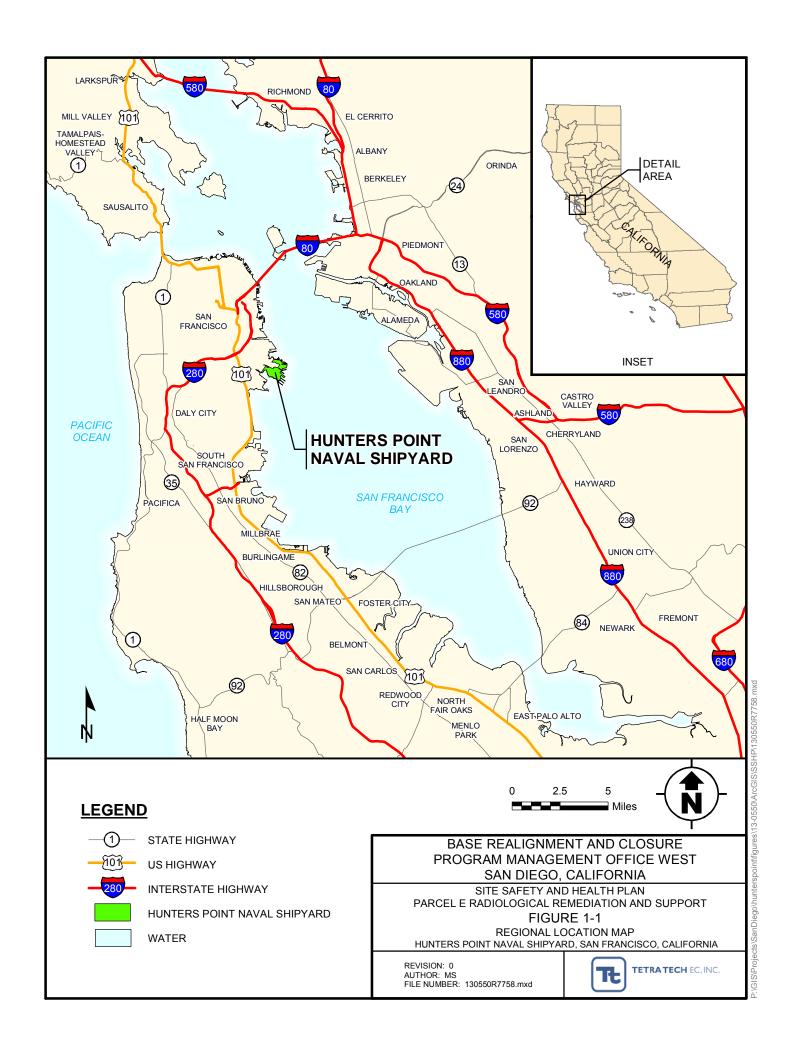
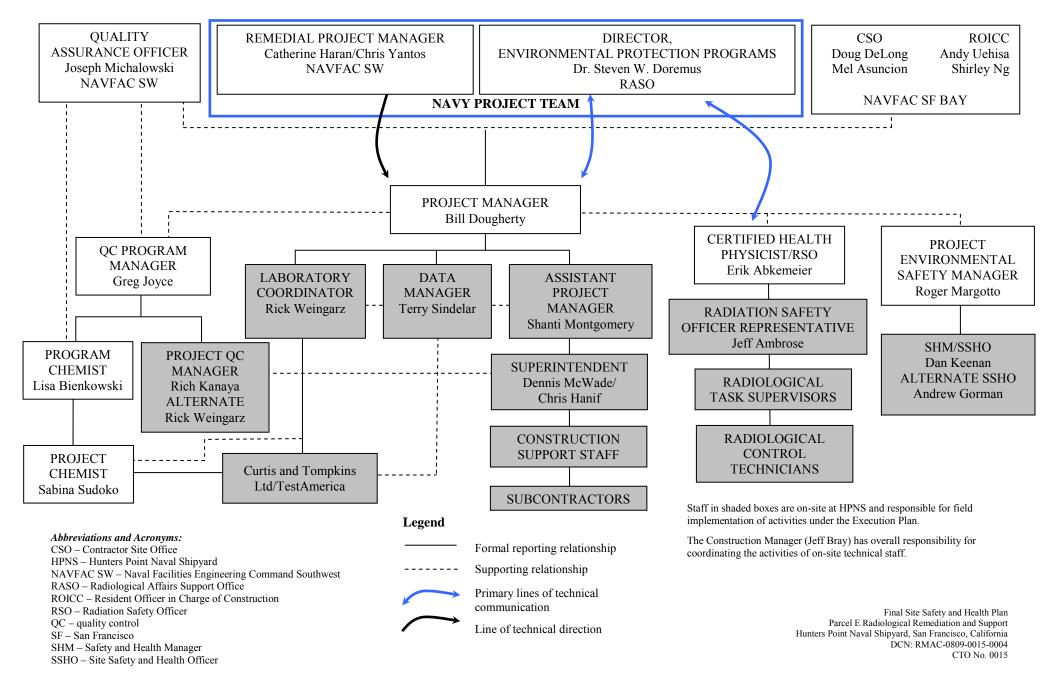


FIGURE 2-1
PROJECT ORGANIZATION CHART



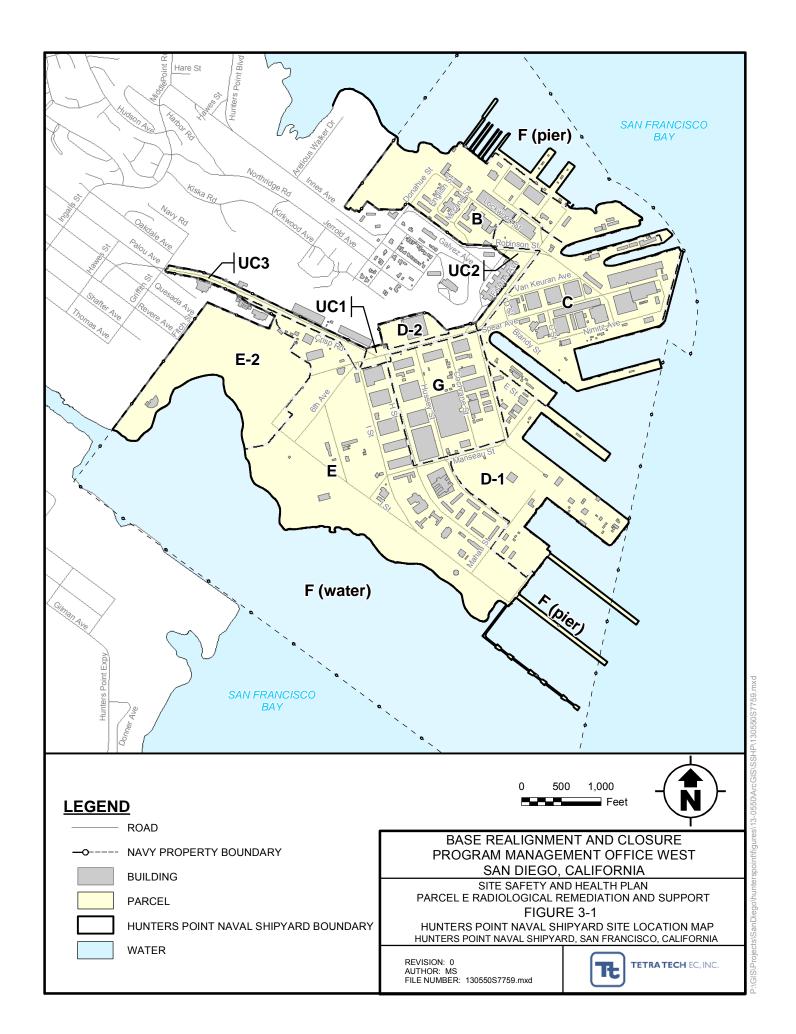
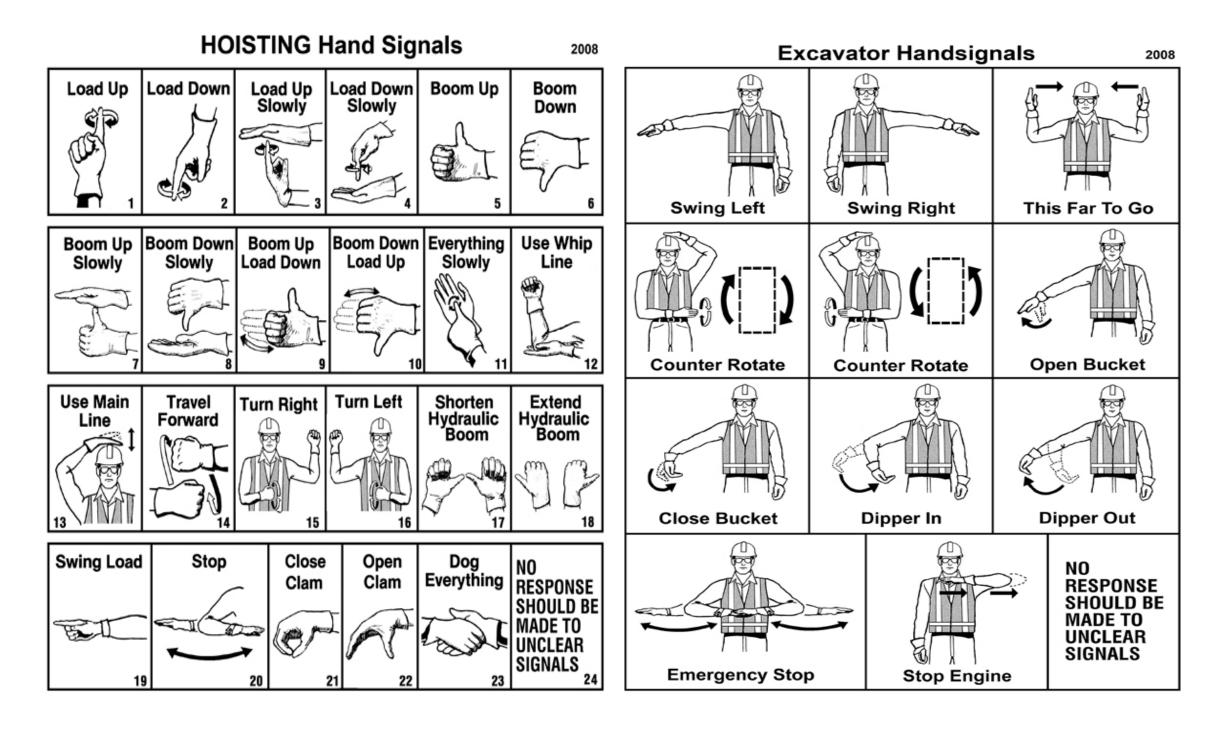
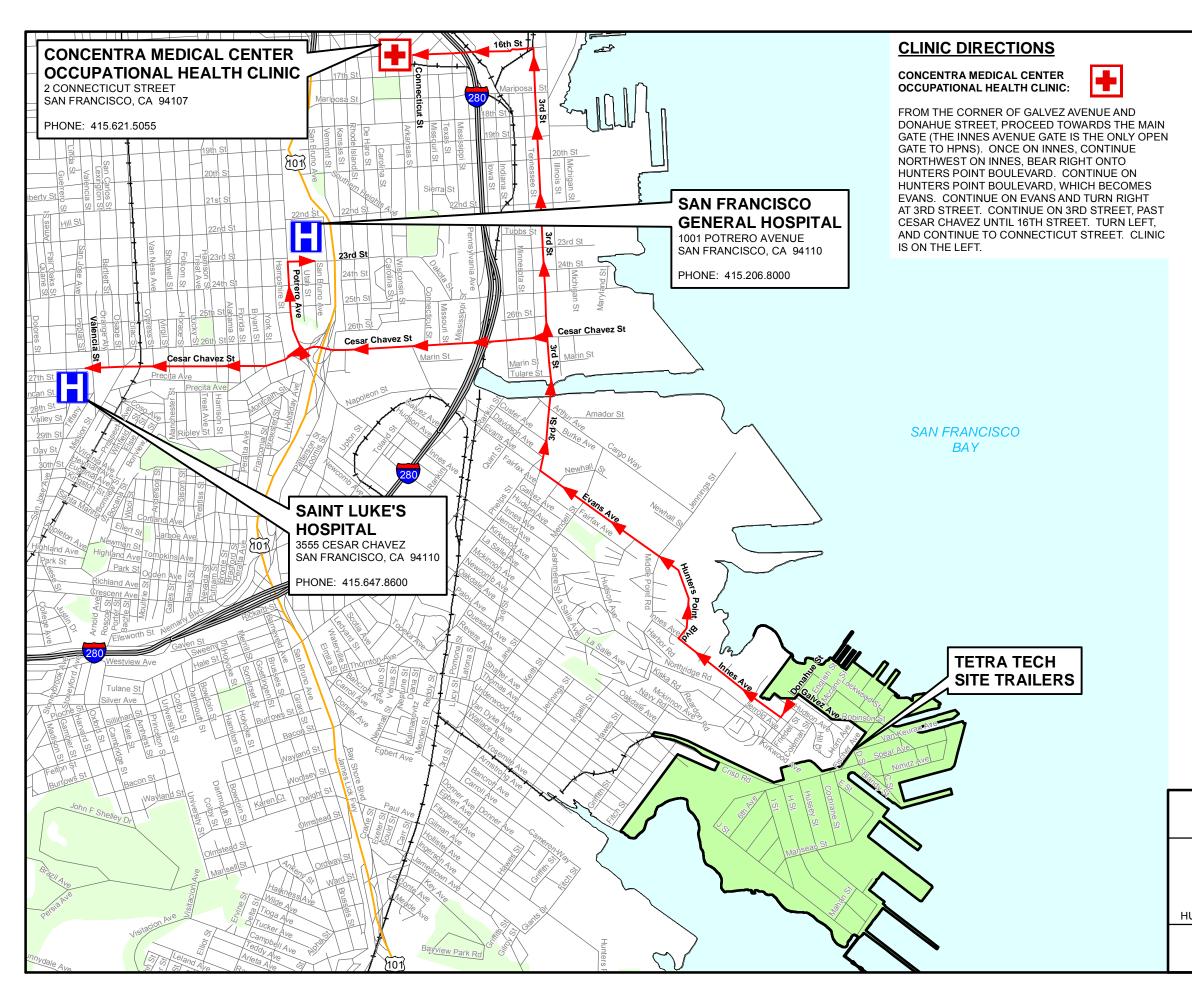


FIGURE 4-1

HAND SIGNALS





LEGEND

HOSPITAL/CLINIC ROUTE

ROAD

101 HIGHWAY

280 INTERSTATE HIGHWAY

→ RAILROAD

PARK

WATER

HUNTERS POINT NAVAL SHIPYARD BOUNDARY

HOSPITAL DIRECTIONS

SAN FRANCISCO GENERAL HOSPITAL:



FROM THE CORNER OF GALVEZ AVENUE AND DONAHUE STREET, PROCEED TOWARDS THE MAIN GATE (THE INNES AVENUE GATE IS THE ONLY OPEN GATE TO HPNS). ONCE ON INNES, CONTINUE NORTHWEST ON INNES, BEAR RIGHT ONTO HUNTERS POINT BOULEVARD. CONTINUE ON HUNTERS POINT BOULEVARD, WHICH BECOMES EVANS. CONTINUE ON EVANS AND TURN RIGHT AT 3RD STREET. CONTINUE TO CESAR CHAVEZ. TURN LEFT ONTO CESAR CHAVEZ. CONTINUE WEST UNDER THE 280 FREEWAY AND CONTINUE UNDER THE 101 FREEWAY, TURN RIGHT ON POTRERO. CONTINUE ON POTRERO, HOSPITAL WILL BE ON THE RIGHT ON 23RD STREET.

SAINT LUKE'S HOSPITAL:



FROM THE CORNER OF GALVEZ AVENUE AND DONAHUE STREET, PROCEED TOWARDS THE MAIN GATE (THE INNES AVENUE GATE IS THE ONLY OPEN GATE TO HPNS). ONCE ON INNES, CONTINUE NORTHWEST ON INNES, BEAR RIGHT ONTO HUNTERS POINT BOULEVARD. CONTINUE ON HUNTERS POINT BOULEVARD, WHICH BECOMES EVANS. CONTINUE ON EVANS AND TURN RIGHT AT 3RD STREET. CONTINUE TO CESAR CHAVEZ. TURN LEFT ONTO CESAR CHAVEZ. CONTINUE WEST UNDER THE 280 FREEWAY AND CONTINUE UNDER THE 101 FREEWAY, CONTINUE ON CESAR CHAVEZ; HOSPITAL WILL BE ON THE LEFT AT THE CORNER OF VALENCIA STREET.



BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE WEST SAN DIEGO. CALIFORNIA

SITE SAFETY AND HEALTH PLAN
PARCEL E RADIOLOGICAL REMEDIATION AND SUPPORT

FIGURE 12-1

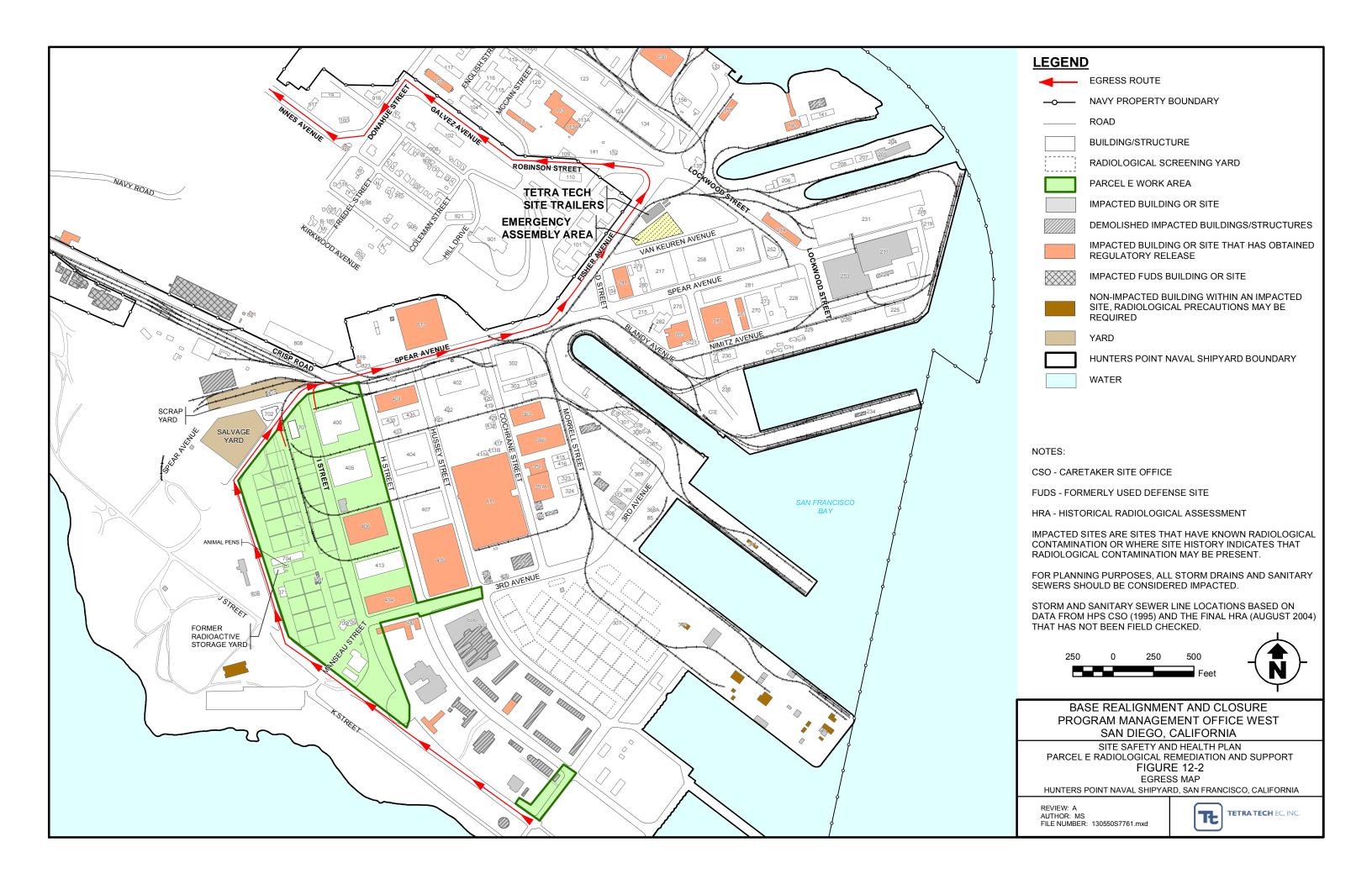
ROUTES TO THE CLINIC AND HOSPITALS

HUNTERS POINT NAVAL SHIPYARD, SAN FRANCISCO, CALIFORNIA

REVIEW: A AUTHOR: MS

FILE NUMBER: 130550S7760.mxd





APPENDIX A FORMS

Initial Report
Follow-up Report
Final Report

Contractor Significant Incident Report (CSIR)

1. General Information Contracting Activity/ROICC Office:					
Accident Classification:					
☐ Injury ☐ Fatality	☐ Environment ☐	Procedural Issues	Lessor	ns Learned	
☐ Illness ☐ Property ☐	Damage	Other			-
Involving:					
☐ Confined Space ☐	Equip/Mrt Ver/Mat Handling	(Heavy Construction Equ	uip.) 🔲 I	Hazardous I	Material
☐ Crane and Rigging ☐	Equip/Mrt Ver/Mat Handling	(Material Handling)		Trenching/E	xcavation
☐ Diving ☐	Equip/Mrt Ver/Mat Handling	(Man-Lift/Elevated Platfo	orm) 🔲 '	Waterfront/N	Marine Operations
☐ Demolition/Renovation ☐	Fall from Ladder	I from Scaffold		Other	
☐ Electrical ☐	Fall from Roof Fire	e			
2. Personal Informatio	on				
Name (Last, First, MI):				Age:	Sex:
Job Title/Description:		Employed By:			
Supervisor Name (Last, First	st, MI) & Title:	Was the person traind ☐ Yes	ed to pe ا 🗖		activity/task?
		i Yes		NO	
What type of training was received (OJT,		Date of the most rece	ent form	al training	and topics
classroom, etc)?		discussed?			
0.14//4			_		
3. Witness Information Witness #1: Name (Last, Fin		Job Title/Description	n·		
Triano (Last, Fri		COS TILIO, DOCOTIPLIO	••		
Employed By:		Supervisor Name (La	ast, Firs	t, MI):	
		,		,	
Witness #2: Name (Last, Fir	rst, MI):	Job Title/Description	ո։		
Employed By:		Supervisor Name (La	ast, Firs	t, MI):	
Additional Witnesses: (List any additional witnesses on a separate sheet and attach.)					
(LIST AITY AUDITIONAL WITHESS	ses on a separate sneet an	u attacn.)			

4. Contract Info	rmation		
Type of Contract:		_	
	□ BOS □ CLEAN		uction Design Build FSCC FSSC
□ JOC		e	
Contract Number 8	& Title:		Industrial Group & Industrial Type:
Prime Contractor N	Name/Address/Phone	& Fax No:	Sub Contractor Name/Address/Phone & FAX No:
Safety Manager (La	ast, First, MI):		Safety Manager (Last, First, MI):
Insurance Carrier:			Insurance Carrier:
5. Accident Des	cription		
Date of Accident:	Time of Accident:	Exact Locat	ion of Accident:
Describe the accid	ent in detail in your w	ords: (Use th	ne back of page if you need additional space)
Direct Cause(s) of Accident:			

Indirect Cause(s) of Accident:				
Action(s) taken to prevent re-occurrence or provi	do on going corrective actions.			
Action(s) taken to prevent re-occurrence or provi	de on-going corrective actions:			
Corrective Action Beginning Date:	Anticipated Completion Date:			
Personal Protective Equipment:	<u> </u>			
	able and not used			
☐ Not related to Mishap ☐ Wror	ng PPE for job			
Not related to Mishap				
List PPE Used:				
Type of Construction Equipment (Make, Model, S	erial #, VIN#) Involved:			
Was Hazardous Material Spilled/Released?	☐ Yes ☐ No			
Please List Hazardous Material(s) Involved:				
Who provided first aid or cleanup of mishap site?				
Any blood-borne pathogen exposure, other than	EMTs?			
vary blood belief paniegon expectate, caller alan	les la No			
Who?				
List OSHA and EM-385-1-1 standards that were v	olated:			
Was site secured and witness statements taken in	nmediately?			
By Whom?				

6. Injury Illness/Fatality Information					
Severity of Injury/Illness:					
☐ Fatality	☐ Fatality ☐ Lost Workday Case Involving Days Away From Work				
☐ Temporary Disabillity	☐ Temporary Disabillity ☐ Recordable Workday Case Involving Restricted Duty				
Permanent Total Disability	☐ Permanent Total Disability ☐ Other Recordable Case ☐ Recordable First Aid Case				
Permanent Partial Disability	□ Non-Recordable Case	No Injury			
Estimated Days Lost:	Estimated Days Hospitalized:	Estimated Days R	estricted Duty:		
		_			
List Primary Body Part Affected:	List Other Body Part(s) Affected	d:			
Notice of Injury/Illness for Drimon	, Bady Bort (Evennles, Amnutet	ian Burn Harnia).			
Nature of Injury/Illness for Primary	, Body Fart (Examples, Amputat	ion, Burn, Herma).			
Type of Accident (Examples: Fall s	same level, Lifting, Bitten, Exerte	ed):			
Course of Assident /Frameles Or	one Coulem Menevide Ledden	Molding Fautors	Λ.		
Source of Accident (Examples: Cr	ane, Carbon Monoxide, Ladder, V	welding Equipment	:):		
7. Causal Factors (Explain al	newers on supplementary	shoot)			
	rkplace, or equipment was a fac		☐ Yes ☐ No		
Inspection/Maintenance – Inspection & Maintenance procedures were a factor?					
Persons Physical Condition – person was a factor?	In your opinion, the physical cor	ndition of the	☐ Yes ☐ No		
	ting procedures were a factor?		☐ Yes ☐ No		
Job Practices – One or more jowhen the accident occurred co	ob safety/health practices not be ontributed to the accident?	ing followed	☐ Yes ☐ No		
Human Factors – One or more strength contributed to the acc	human factors, such as a perso cident?	n's size or	☐ Yes ☐ No		
Chemical and Physical Agent Factors – Exposure to chemical agents, such as dust, fumes, mist, vapors, or physical agents such as noise, radiation, etc.,			☐ Yes ☐ No		
contributed to the accident?					
contributed to the accident?	The results of the re				
task?	Tes INO				
 PPE – Improper selection, use accident? 	Yes No				
Drugs/Alcohol – In your opinion	on, were drugs or alcohol a facto	r?	☐ Yes ☐ No		
Job Hazard Analysis – The lac activity hazard analysis was a	k of an adequate (IAW-EM-385-1- contributing factor.	-1 Sec 01.A)	☐ Yes ☐ No		
Job Hazard Analysis – JHA wa	Job Hazard Analysis – JHA was not site specific and/or did not address the type				
	of work/operations performed when the mishap occurred. Management – A lack of adequate supervision contributed to the accident.				
			☐ Yes ☐ No		

8. OSHA Information				
	Date OSHA was Notified:	Date(s) of Investigation:	Date of citation: (Attach Copy)	Dollar amount of Penalties:
	9. Report Preparer			
	Name (Last, First, MI):		Date of Report:	
	Title:		Signature:	
	Employer:			
	Phone #:			

CONTRACTOR SIGNIFICANT INCIDENT REPORT (CSIR) INSTRUCTIONS Complete Sections Appropriate to Incident (Rev. 06/02).

NOTE: THE ATTACHED CSIR FORM IS TO BE USED BY CONTRACTORS TO RECORD THE RESULTS OF THEIR ACCIDENT/INCIDENTS INVESTIGATIONS AND SHALL BE PROVIDED TO THE CONTRACTING OFFICER WITHIN THE REQUIRED TIMEFRAMES.

GENERAL. Complete a separate report for each person who was injured in the accident. A report needs to be completed for all OSHA recordable accidents, property damage in excess of \$2000.00 (This amount is for record purposes only. GOV is not required to enter property damage reports into FAIR database if it is less than \$10,000.00.), WHE accidents, or near miss/high visibility mishaps. Please type or print legibly. Appropriate items shall be marked with an "X" in box(es), non-applicable sections shall be marked "N/A". If additional space is needed, provide the information on a separate sheet of paper and attach to the completed form.

Mark the report:

INITIAL – If this form is being used as initial notification of a Fatality or High Visibility Mishap. The initial form is due within 4 hours of a serious accident. A form marked 'Follow-up' or 'Final' is required within 5 days.

FOLLOW-UP - If you are providing additional information on a report previously submitted.

FINAL – If you are providing a completed report and expect no changes.

SECTION 1 – GENERAL INFORMATION

CONTRACTING ACTIVITY/ROICC OFFICE - Enter the name and address of the Contracting Office administering the contract under which the mishap took place (e.g. ROICC MCBH, ROICC NORFOLK, PWC GUAM, etc.).

ACCIDENT CLASSIFICATION - INJURY/ILLNESS/FATALITY/PROPERTY DAMAGE/-PROCEDURAL ISSUES/-ENVIRONMENTAL/LESSONS LEARNED/OTHER – Mark the appropriate block(s) if the incident resulted in any of these conditions.

INVOLVING - If the mishap involved any of the conditions listed under "Involving" mark the appropriate box(es). Specific questions associated with each of these conditions are available from the Contracting Officer to assist you in your investigation. When these questions are used they shall be attached as part of this report.

SECTION 2 - PERSONAL INFORMATION

NAME - Enter last name, first name, middle initial of person involved.

AGE - Enter age.

SEX - Enter M for Male and F for Female.

JOB TITLE/DESCRIPTION - Enter the job title/description assigned to the injured person (e.g. carpenter, laborer, surveyor, etc.). **EMPLOYED BY** - Enter employment company name of the person involved.

SUPERVISOR'S NAME & TITLE - Enter name and title of the immediate supervisor.

WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? - For the purpose of this section "trained" means the person has been provided the necessary information (either formal and/or on-the-job (OJT) training) to competently perform the activity/task in a safe and healthful manner.

TYPE OF TRAINING - Indicate the specific type of training (classroom or on-the-job) that the injured person received before the accident happened.

DATE OF MOST RECENT FORMAL TRAINING/TOPICS DISCUSSED - Enter the month, day, and year of the last *formal* training completed that covered the activity/task being performed at the time of the accident. List topics that were discussed at the training identified above.

SECTION 3 - WITNESS INFORMATION

The following applies to Witness #1 and Witness #2:

WITNESS NAME - Enter last name, first name, middle initial of the witness.

JOB DESCRIPTION/TITLE - Enter the job title/description assigned to the witness (e.g. carpenter, laborer, surveyor, etc.).

EMPLOYED BY - Enter the name of the employment company of the witness.

SUPERVISORS NAME - Enter name of immediate supervisor of the witness.

ADDITIONAL WITNESSES - Provide same information, as above, for each witnesses. Use additional pages if necessary.

SECTION 4 - CONTRACTOR INFORMATION

TYPE OF CONTRACT - Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.

CONTRACT NUMBER/TITLE - Enter complete contract number and tile of prime contract (e.g. N62477-85-C-0100, 184 Pearl City Hsg. Revitalization).

CONSTRUCTION INDUSTRIAL GROUP AND INDUSTRIAL TYPE - This is the type of construction that will be done at this project.

1. First, you must choose the Industrial Group. You have 4 choices to choose from: (NOTE! Review of the Industrial Types below and knowing what the projects scope of work is will assist you in deciding what the Industrial Group should be.)

- a. Buildings
- b. Heavy Industrial
- c. Infrastructure
- d. Light Industrial
- 2. Once you have chosen the Industrial Group, you now select the Industrial Type. You have multiple choices under each Group, chose the one you feel fits the project most closely because on most projects there won't be an exact match:
 - a. Buildings:
 - (1) Communications Ctr.
 - (2) Dormitory/Hotel
 - (3) High-rise Office
 - (4) Hospital
 - (5) Housing
 - (6) Laboratory
 - (7) Low-rise Office
 - (8) Maintenance Facility
 - (6) Maintenance Facili
 - (9) Parking Garage
 - (10) Physical Fitness Ctr.
 - (11) Restaurant/Nightclub
 - (12) School
 - (13) Warehouse
 - b. Heavy Industrial:
 - (1) Chemical Mfg.
 - (2) Electrical (Generating)
 - (3) Environmental
 - (4) Metals Refining/Processing
 - (5) Mining
 - (6) Natural Gas Processing
 - (7) Oil Exploration/Production
 - (8) Oil Refining
 - (9) Pulp and Paper
 - c. Infrastructure:
 - (1) Airport
 - (2) Electrical Distribution
 - (3) Flood Control
 - (4) Highway
 - (5) Marine Facilities
 - (6) Navigation
 - (7) Rail
 - (8) Tunneling
 - (9) Water/Wastewater
 - d. Light Industrial:
 - (1) Automotive Assembly/Mfg.
 - (2) Consumer Products Mfg.
 - (3) Foods
 - (4) Microelectronics Mfg.
 - (5) Office Products Mfg.
 - (6) Pharmaceuticals Mfg.

CONTRACTOR'S NAME/ADDRESS/PHONE NUMBER

- (1) PRIME Enter the exact name (title of firm), address, phone and fax numbers of the prime contractor.
- (2) SUBCONTRACTOR Enter the exact name, address, phone and fax numbers of any subcontractor involved in the accident.

SAFETY MANAGER'S NAME

- (1) PRIME Enter the name of the prime contractor safety manager.
- (2) SUBCONTRACTOR Enter the name of the subcontractors safety manager.

INSURANCE CARRIER

- (1) PRIME Enter the exact name/title of the prime's insurance company. Policy number not required.
- (2) SUBCONTRACTOR Enter the exact name of the subcontractor's insurance company. Policy number not required.

SECTION 5 - ACCIDENT DESCRIPTION

DATE OF ACCIDENT - Enter the month, day, and year of accident.

TIME OF ACCIDENT - Enter the local time of accident in military time. Example: 14:30 hrs (not 2:30 p.m.).

EXACT LOCATION OF ACCIDENT - Enter facts needed to locate the accident scene (installation/project name, building/room number, street, direction and distance from closest landmark, etc.).

DESCRIBE THE ACCIDENT IN DETAIL. Fully describe the accident in the space provided. If property damage involved, give estimated dollar amount of damage and/or repair costs involved. If additional space is needed continue on a separate sheet and attach to this report. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Ensure questions below regarding direct cause(s), indirect cause(s), and actions taken are answered. **NOTE!** Review questions in Section 7 below before completing.

DIRECT CAUSE(S) - The direct cause is that single factor which most directly lead to the accident. See examples below. **INDIRECT CAUSE(S)** - Indirect cause are those factors, which contributed to, but did not directly initiate the occurrence of the accident.

Examples for Direct and Indirect Cause:

1. Employee was dismantling scaffold and fell 12 feet from unguarded opening.

Direct cause: Failure to provide fall protection at elevation

Indirect causes: Failure to enforce safety requirements: improper training/motivation of employee (possibility that employee was not knowledgeable of fall protection requirements or was lax in his attitude toward safety); failure to ensure provision of positive fall protection whenever elevated; failure to address fall protection during scaffold dismantling in phase hazard analysis.

2. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by contractor vehicle. (note contractor vehicles was in proper safe working condition.)

Direct cause: Failure of contractor driver to maintain control of and stop contractor vehicle within safe distance. Indirect cause: Failure of employee to pay attention to driving (defensive driving).

ACTION(S) TAKEN TO PREVENT RE-OCCURRENCE OR PROVIDE ON-GOING CORRECTIVE ACTIONS. Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on back or additional sheets of paper if necessary to fully explain and attach to the complete report form. **CORRECTIVE ACTION DATES -**

- (1) Beginning Enter the date when the corrective action(s) identified above will begin.
- (2) Anticipated Completion Enter the date when the corrective action(s) identified above will be completed.

PERSONAL PROTECTIVE EQUIPMENT (PPE) - Mark appropriate box(es) and list PPE which was being used by the injured person at the time of the accident (e.g. protective clothing, shoes, glasses, goggles, respirator, safety belt, harness, etc.)

TYPE OF CONTRACTOR EQUIPMENT - Enter the Serial Number, Model Number and specific type of equipment involved in the mishap (e.g. dump truck (off highway), crane (rubber tire), pump truck (concrete), etc.).

WAS HAZARDOUS MATERIAL SPILLED/RELEASED? - Mark appropriate block and list name(s) of any reportable quantities of hazardous materials spilled/released during the mishap.

WHO PROVIDED FIRST AID OR CLEAN-UP OF MISHAP SITE? - List name(s) of individual(s) and employer, if known.

ANY BLOOD-BORNE PATHOGEN EXPOSURE, OTHER THAN EMT? - Mark appropriate block and list name(s) of individual(s) and employer, if known.

LIST ÓSHA AND/OR EM 385-1-1 STANDARDS THAT WERE VIOLATED. - Self explanatory.

WAS SITE SECURED AND WITNESS STATEMENT TAKEN IMMEDIATELY? - Mark appropriate block and list by whom.

SECTION 6 - INJURY/ILLNESS/FATALITY INFORMATION

SERVERITY OF INJURY/ILLNESS - Mark appropriate box.

ESTIMATED DAYS LOST - Enter the estimated number of workdays the person will lose from work. Update when final data is known. **ESTIMATED DAYS HOSPITALIZED** - Enter the estimated number of workdays the person will be hospitalized. Update when final data is known.

ESTIMATED DAYS RESTRICTED DUTY - Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties. Update when final data is known.

BODY PART(S) AFFECTED - Enter the most appropriate primary and when applicable, secondary, etc. body part(s) affected (e.g. arm: wrist: abdomen: single eye; jaw: both elbows: second finger: great toe: collar bone: kidney, etc.).

NATURE OF INJURY/ILLNESS FOR PRIMARY BODY PART - Enter the most appropriate nature of injury/illness (e.g. amputation, back strain, dislocation, laceration, strain, asbestosis, food poisoning, heart conditions, etc.).

TYPE AND SOURCE OF INJURY/ILLNESS - Type and Source Codes are used to describe what caused the incident.

(1) TYPE Code stands for an "Action" (Example: Worker, installing conduit, lost his balance and fell five feet from a ladder. Type Code: Fell different levels".) Select the most appropriate Type of injury from the list below:

TYPE OF INJURY/ILLNESS

STRUCK BY/AGAINST	CONTACTED CONTACTED WITH (INJURED PERSON MOVING) CONTACTED BY (OBJECT WAS MOVING)
FELL, SLIPPED, TRIPPED SAME LEVEL/DIFFERENT LEVEL/NO FALL	EXERTED LIFTED, STRAINED BY (SINGLE ACTION) STRESSED BY (REPEATED ACTION)
CAUGHT ON/IN/BETWEEN	EXPOSED INHALED/INGESTED/ABSORBED/EXPOSED TO
PUNCTURED, LACERATED PUNCTURED BY/CUT BY/STUNG BY/BITTEN BY	TRAVELING IN

(2) SOURCE Code stands for an "object or substance." (Example: Worker, installing conduit, lost his balance and fell five feet from a ladder. Source Code: "Ladder".) Select the most appropriate Source of injury from the list below:

SOURCE OF INJURY/ILLNESS

BUILDING OR WORKING AREA	DUST, VAPOR, ETC.
	,,
WALKING/WORKING AREA	DUST (SILICA, COAT, ETC.)
STAIRS/STEPS	FIBERS
LADDER	ASBESTOS
FURNITURE	GASES
BOILER/PRESSURE VESSEL	CARBON MONOXIDE
EQUIPMENT LAYOUT	MIST, STEAM, VAPOR, FUME
WINDOWS/DOORS	WELDING FUMES
ELECTRICITY	PARTICLES (UNIDENTIFIED)

ENVIRONMENT CONDITION	CHEMICAL, PLASTIC, ETC.
TEMPERATURE EXTREME (INDOOR)	DRY CHEMICAL - CORROSIVE
WEATHER (ICE, RAIN, HEAT, ETC.)	DRY CHEMICAL - TOXIC
FIRE, FLAME, SMOTE (NOT TABACCO)	DRY CHEMICAL - EXPLOSIVE
NOISE	DRY CHEMICAL - FLAMMABLE
	LIQUID CHEMICAL - CORROSIVE
RADIATION	LIQUID CHEMICAL - TOXIC
LIGHT	LIQUID CHEMICAL - EXPLOSIVE
VENTILATION	LIQUID CHEMICAL - EXPLOSIVE LIQUID CHEMICAL - FLAMMABLE
TOBACCO SMOKE	
STRESS (EMOTIONAL)	PLASTIC
CONFINED SPACE	WATER
	MEDICINE
MACHINE OR TOOL	INANIMATE OBJECT
HAND TOOL (POWERED: SAW, GRINDER, ETC.)	BOX, BARREL, ETC.
HAND TOOL (NON POWERED)	PAPER
MECHANCIAL POWER TRANSMISSION APPARATUS	METAL ITEM, MINERAL
GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK)	NEEDLE
VIDEO DISPLAY TERMINAL	GLASS
PUMP, COMPRESSOR, AIR PRESSURE TOOL	SCRAP, TRASH, WOOD
HEATING EQUIPMENT	FOOD
WELDING EQUIPMENT	CLOTHING, APPAREL, SHOES
MACHINE OR TOOL	INANIMATE OBJECT
HAND TOOL (POWERED: SAW, GRINDER, ETC.)	BOX, BARREL, ETC.
HAND TOOL (NON POWERED)	PAPER
MECHANCIAL POWER TRANSMISSION APPARATUS	METAL ITEM, MINERAL
GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK)	NEEDLE NEEDLE
	GLASS
VIDEO DISPLAY TERMINAL	
PUMP, COMPRESSOR, AIR PRESSURE TOOL	SCRAP, TRASH, WOOD
HEATING EQUIPMENT	FOOD
WELDING EQUIPMENT	CLOTHING, APPAREL, SHOES
VEHICLE	ANIMATE OBJECT
AS DRIVER OF PRIVATELY OWNED, RENTAL VEH.	DOG
AS PASSENGER OF PRIVATELY OWNED, RENTAL VEH.	OTHER ANIMAL
DRIVER OF GOVERNMENT VEHICLE	PLANT
PASSENGER OF GOVERNMENT VEHICLE	INSECT
COMMON CARRIER (AIRLINE, BUS, ETC.)	HUMAN (VIOLENCE)
AIRCRAFT (NOT COMMERCIAL)	HUMAN (COMMUNICABLE DISEASE)
BOAT, SHIP, BARGE	BACTERÌA, VIRUS (NOT HUMAN CONTACT)
MATERIAL HANDLING EQUIPMENT	PERSONAL PROTECTIVE EQUIPMENT
EARTHMOVER (TRACTOR, BACKHOE, ETC.)	PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES
CONVEYOR (FOR MATERIAL AND EQUIPMENT)	RESPIRATOR, MASK
ELEVATOR, ESCALATOR, PERSONNEL HOIST	DIVING EQUIPMENT
HOIST, SLING CHAIN, JACK	SAFETY BELT, HARNESS
CRANE	PARACHUTE
FORKLIFT	I AIMOHUTE
HANDTRUCK, DOLLY	

SECTION 7 - CAUSAL FACTORS

Review thoroughly. Answer each question by marking the appropriate block. NOTE! If any answer is yes, explain in section 5 above.

- (1) **DESIGN** Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?
- (2) **INSPECTION/MAINTENANCE** Did inadequately or improperly maintained equipment, tools, workplace, etc., create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?
- (3) **PERSONS PHYSICAL CONDITION** Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was overexertion a factor?
- (4) **OPERATION PROCEDURES** Did lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?
- (5) **JOB PRACTICES** Were any of the provision of the Safety and Health Requirements Manual (EM 385-1-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?
- (6) **HUMAN FACTORS** Was the person under undue stress (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person: i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach strengths, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?
- (7) **ENVIRONMENTAL FACTORS** Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun temperature changes, wind, tides, floods, currents, terrain; dust, mud, glare, pressure changes, lighting, etc., play a part in the accident?

- (8) CHEMICAL AND PHYSICAL AGENT FACTORS Did exposure to chemical agents (either single shift exposure or long-term exposure such as dusts, fibers, (asbestos, etc.), silica, gases (carbon, monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?
- (9) **OFFICE FACTORS** Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?
- (10) **SUPPORT FACTORS** Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized and adequate to provide proper tools, equipment, personnel, site preparation, etc.
- (11) **PERSONAL PROTECTIVE EQUIPMENT** Did the person fail to use appropriate personal protective equipment (gloves, eye protection, hard-toed shoes, respirator, etc) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident? (12) **DRUGS/ALCOHOL** Is there any reason to believe the person's mental or physical capabilities, judgment, etc., were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".
- (13) **JOB/ACTIVITY HAZARD ANALYSIS** Was a written Job/Activity Analysis completed for the task being performed at the time of the accident? If one was made, did it address the hazard adequately or does it need to be updated? If none made, will one be made? These may also need to be addressed in the Corrective Actions Taken section. Mark the appropriate box. If one was made, attach a copy of the analysis to the report.
- (14) MANAGEMENT Did the lack of supervisor or management support play a part in the mishap? Mark the appropriate box.

SECTION - 8 OSHA INFORMATION - Complete this section if applicable

SECTION 9 - REPORT PREPARER

Providing a completed CSIR to the Contracting Officer is the PRIME CONTRACTOR'S RESPONSIBILITY. Enter the name, date of report, title, employer, phone number and signature of person completing the accident report and provide it to the Contracting Officer, or his representative, responsible for oversight of that contractor activity. NOTE! If prepared by other than the Prime Contractor, a person employed by the Prime Contractor must sign that they have reviewed and concur with the report and it's findings (e.g. company owner, project supervisor/foreman, Safety Officer, etc.).



DAILY BRIEFING SIGN-IN SHEET

Date: Project	Name/Location:
Shift/Department: Person	Conducting Briefing:
1. AWARENESS (e.g., special EHS concerns, pollution prevention, recent incidents, etc.):	
2. OTHER ISSUES (EHS Plan changes, attendee comments, etc.):	
3. ATTENDEES (Print Name):	
1.	21.
2.	22.
3.	23.
4.	24.
5.	25.
6.	26.
7.	27.
8.	28.
9.	29.
10.	30.
11.	31.
12.	32.
13.	33.
14.	34.
15.	35.
16.	36.
17.	37.
18.	38.
19.	39.
20.	40.



Daily Briefing Sign-In Sheet

(Continued)

41.	56.
42.	57.
43.	58.
44.	59.
45.	60.
46.	61.
47.	62.
48.	63.
49.	64.
50.	65.
51.	66.
52.	67.
53.	68.
54.	69.
55.	70.

Give completed documentation to ESO.



FIELD TEAM REVIEW SHEET

Each field team shall sign this section after site-specific training is completed and before being permitted to work on-site.

I have read and understand this Site Health and Safety Plan for **HUNTERS POINT NAVAL SHIPYARD, SAN FRANCISCO, CALIFORNIA**.

I will comply with the provisions contained herein.

Print Name	Signature	Date



MEDICAL DATA SHEET

Project:				
Name:				
Home Telepho	one Number:			
Home Address	s:			
Age:	Height:	Weight:	Blood Type:	
Name of Emer	gency Contact:			
Telephone Nu	mber of Emergency Co	ontact:		
Drug or Other	· Allergies:			
Particular Sen	sitivities:			
Do you wear c	ontact lenses?			
Provide a chec	klist of previous illness	s or exposures to hazard	lous chemicals:	
What medicati	ions are you presently t	using?		
Do you have a	ny medical restrictions	? If yes, explain:		
Name address	and phone number of	f narganal physicians		
rame, address	s, and phone number of	i personai physician:		



DAILY EQUIPMENT INSPECTION

PROJECT		_		
MANUFACTURER TYPE				
UNIT #MODEL				
ENGINE HRS/MILEAGE				
Check appropriate	column and			
	If Good (✓)	NA	Correction Neede	d
Steering Mechanisms ^{1 *}	,			
Service Brakes ²				
Emergency Brakes ¹				
Parking Brake ¹				
Transmission & Controls				
Suspension & Springs				
Hydraulic Leaks				
Exhaust System				
Warning Gauges Windshield ¹ & Wipers				
Lights (Head & Tail)				
Brake Lights ¹				
Mirrors	-			
Seat and Seat Belts ¹ (w/ ROPS)				
Tires/Tread ¹				
Regular Horn				
Audible Back-up Alarm ¹				
Steps, Hand-holds				
Fire Extinguisher				
Engine Coolant Engine Oil	 -			
Hydraulics & Operating Controls				
Fenders/Mudflaps				
Heater/defroster		·		
		· <u></u>		
Remarks:				·
¹ Items required to be operational by 0	OSHA 1926.6	602 before use.		
² Service brake must be capable of sto				
Service brane mast be supuble of the	oppnig and h	ioianig oquipinio	The range roadous	
Operator Name (Printed)		Operato	or Signature	
	uperintender	nt		
Date Repairs or adjustments complete	ed:			
Equipment Supervisor/Mechanic:				



DAILY SAFETY & HEALTH REPORT

^{Project:} Hunters Point Naval Sh	пруаги					
Contract #:	Activity/Ar	rea				
Weather:	Tem	nperature:	High	Low		
<u>Inspection</u>	OK Co	ondition	Ins	pection	<u>OK</u>	Condition
Checklist			Ch	ecklist	<u> </u>	
Fences & Barricades			Lock/	Гад		
Signs & Posting			Hot W	ork ork	-	-
PPE Available & Worn			House	ekeeping		
Vehicle Speeds			GFCI	usage		
Excavation Markings			Cords	et Use		
Seatbelt Use			Pinch	points		
Stormwater controls			SPCC	Inspect.		
PPE Levels			Waste	Storage		
Safety & Health Activities	5					
	Safety & He	ealth				
			ature			Date



Equipment/Vehicle Inspection Report

Date:		Ţ	nit Numb	er:	Descrip	tion:			
Miles or	_ Hours	:		_ N	ИF <u>G:</u>				
Unit to be taken	from:				to:				
	Good	Satisfactory	Repair Req.	N/A		Good	Satisfactory	Repair Req.	N/A
1. Tires/Track %*					17. Interior				
 Brakes Steering Undercarriage Suspension Engine Drive Train Fuel System Cooling Syster Electrical Syst Exhaust Syster Hydraulic Syst Transmission Clutch Body ROP 		000000000000000000000000000000000000000	000000000000000	000000000000000000	 Glass Wipers/Review Mirrors Heater/AC/Defroster Safety Equipment/Belts Signal Lights Mounted Equipment Mounted Attachments Blade/Bucket Boom Outriggers Fire Ext./First Aid Kit Horn/Backup Alarm Manufacturer Operating Manual Head/Tail/Brake Lights Cleanliness 	000000000000000000000000000000000000000	00000000000000	0000000000000000	000000000000000000000000000000000000000
* Note estimated per Comments:									
DISTRIBUTION: (Copy	1) Sent with	equipment	(2) Tetra T	ech EC	, Inc. Equipment Department (3) Rece	viving Copy	(4) Origi	nator's	

EQUIPMENT TRANSFER REPORT MUST ACCOMPANY THIS FORM

1 of 1

Version Date: 11/20/07 Uncontrolled Copy

Section 1, General Information				
Short Description/Title Below: (limited to 12	5 characters).	This is the description that will ap	ppear in the database listing.	
Type of Event/Near Miss (check all that app	oly):			
Was a person injured or made ill:				
☐ By something at work ☐ By some	ething outside t	he work environment	No injury or illness	
Did this event occur in one of our major offices	s? 🗌 Yes 🗌 N	lo List Office:		
Did this event occur in a foreign country?	′es 🗌 No			
Did this event involve:				
A strain?	es 🗌 No	Fire?	☐ Yes ☐ No	
A motor vehicle accident? Ye	es 🗌 No	Property damage (>\$500)?	☐ Yes ☐ No	
A repetitive motion injury?	es 🗌 No	Spill/release?	☐ Yes ☐ No	
A fall?	es 🗌 No	Permit exceedence?	☐ Yes ☐ No	
Being struck by something? Ye	es 🗌 No			
Event Information		_		
Case #: Site	Case #:	Workers	Comp #:	
Where did the event occur?		Project # (4 digits):		
Site/Location Name:		Delivery Order #'s:		
Date of event:		Military time:		
TtEC Supervisor on duty:		Was Supervisor at event scene	?	
Event Location:				
What employee/employer category was involv	ed in this even	t?		
		☐ TtEC craft/temp se	ervice	
		☐ Subcontractor		
		☐ Other		
Employer of affected employee?				
Weather conditions:	Adequate Li	ghting at Scene? ☐ Yes ☐ No		
What was the employee doing, or what was happening, just before the event occurred? Describe the activity below, as well as the tools, equipment, or material the employee was using. Be specific. For example, "climbing a ladder while carrying roofing materials," "spraying chlorine from hand sprayer," or "daily computer key-entry."				

What happened? What was the conta example, "When the ladder slipped on gasket broke during replacement," or v	the wet floor, the v	worker fell 20 feet," "worke	r was sprayed with chlorine when
Section 2, Affected Employee Information	on		
Include injured person, driver/operator, or created for each injured employee.	employee whose a	ctivities resulted in the eve	ent. A new event report must be
Employee's name:		Sex Male Female	
Date of Hire:	Job classification	1:	Number of months at TtEC:
Work hours on shift prior to event:		Years in job classificatio	n (##):
Did event relate to routine task for job class	sification? Yes	□ No	
Section 3, Injury/Illness Information (If r	ot applicable, che	eck here \square and go to Se	ction 4)
Nature of injury of illness: Describe body por "sore." For example, "strained back."	art affected and ho	w it was affected below. B	e more specific than "hurt," "pain,"
What object or substance directly harmed	the employee? For	example, "concrete floor,"	' "chlorine," "radial arm saw." If this
question does not apply to the event, leave	e it blank.		
Was First Aid provided? ☐ Yes ☐No			
Did the injury/illness result in ☐ Days awa	y (with or without re	estricted days) Restricted	ed days only 🗌 No or unknown
Did employee die? ☐ Yes ☐No	-		
Medical treatment does not include examir First Aid. Attach treatment report/doctor's r			
Was medical treatment provided? ☐ Yes	□ No		
Section 4, Vehicle and Property Damage	Information (If no	ot applicable, check here	e 🗌 and go to Section 5)
Damaged vehicle make:		Damaged vehicle model	:
Damaged vehicle VIN:		Vehicle owner:	
Property damaged:			
Describe property damage:			

Section 5, Environmental Release (If not applicable, che	ck here 🗌 and go to Section 6	5)		
Environmental Release				
Substance spilled or released:				
From where:	To where:			
Estimated quantity/duration:	CERCLA Hazardous substan	ce? 🗌 Yes 🗌 No		
RQ exceeded? ☐ Yes ☐ No	Specify RQ:			
Reportable to agency? Yes No	Specify (place telecom in pro	ject file):		
Responsibility to report: TtEC Client Other	Time frame:			
Written report (place report in project file): ☐ Yes ☐ No				
Response action taken:				
Permit Exceedence				
Type of permit:	Permit #:			
Date of exceedence:	Parameter(s):			
Criteria:	Exceedence levels:			
Exceedence duration:	Reportable to agency: Yes	s 🗌 No		
Specify (place telecom in project file):	Written report: Yes No			
Time frame:				
Response action taken:				
Section 6, Notifications				
Insert names of TtEC personnel notified below:				
Name:	Date:	Time:		
Name:	Date:	Time:		
Name:	Date:	Time:		
Name:	Date:	Time:		
Client rep notified:	Date:	Time:		
By whom:	•	•		
Agency notified:	Date:	Time:		
By whom:	•	•		
Agency Contact Name:				
Section 7, Persons Preparing Report				
Signature of this form verifies that all supplied information is	accurate.			
Employee's name (print):	Sign:			
Employee's name (print):	Sign:			
Supervisor's name (print):	Sign:			
Supervisor's phone number:				
Date:				
Note to supervisor. Supervisor is to forward a copy of the Eventher personnel as identified in Table 1 of this procedure AS		isor, PESM, ESS or ESC, and		

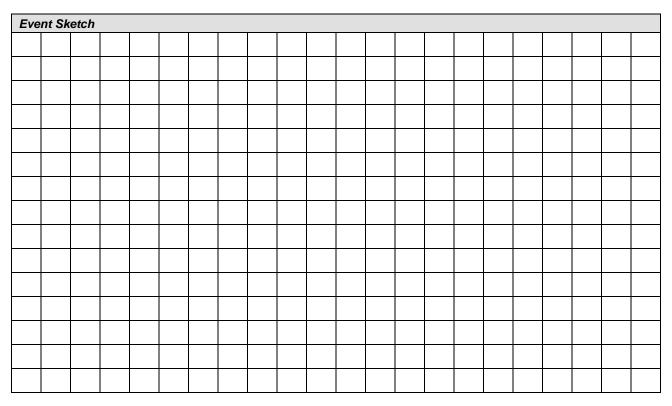
Section 8, Attach Sketches or Photos						
Report Number:						
Send sketch by mail, fax, or attach an electroating sketches of accidents.	Send sketch by mail, fax, or attach an electronic file. EHS 1-7, Attachment C, contains a template that can be used for creating sketches of accidents.					
Vehicle Events						
Write in the street names and, if possible BMP files (JPG file sizes are typically sm this need not be completed. Attach the o	aller) as appropriate.	If the sketch appear	s on a police report or insurance form,			
Section 9, Investigative Report						
Date Information:						
Date of event:		Date of investigative	e report:			
Event Cost:						
Other event costs: \$	WC claim value: \$		Estimated loss: \$			
Cause Analysis						
Was the activity addressed in an AHA? [☐ Yes (attach applica	able section) 🗌 No				
Immediate Causes						
What actions and conditions contributed	to this event? Check	all that apply:				
	Substand	dard Acts				
☐ Operating equipment without authorit	у	☐ Horseplay				
☐ Failure to warn		☐ Using equipment improperly				
☐ Failure to secure		☐ Failure to follow	procedure			
☐ Operating at improper speed		☐ Personnel not p	roperly qualified			
☐ Making safety devices inoperable		☐ Failure to comm	unicate			
☐ Removing safety devices			ment outside of specified parameters			
☐ Using defective equipment		☐ Failure to check	equipment prior to acceptance			
☐ Failure to use PPE properly		☐ Acceptance of d	efective equipment			
☐ Improper loading		☐ Failure to provid	e proper equipment			
☐ Improper placement		☐ Improper servici	ng/maintenance of equipment			
☐ Improper lifting		Other substandard acts				
☐ Improper position for task		☐ Servicing equipment in operation				
Under influence of alcohol/drugs						
<u> </u>	Substandard	d Conditions				
Guards or barriers		:	ardous materials			
Protective equipment		Extreme tempera	ature exposure			
☐ Tools/equipment or materials ☐ Illumination						
☐ Congestion ☐ Ventilation						
☐ Warning system		Visibility				
Fire and explosion hazards		Radiation				
Poor housekeeping			onmental conditions			
☐ Noise exposure ☐ Other substandard conditions						

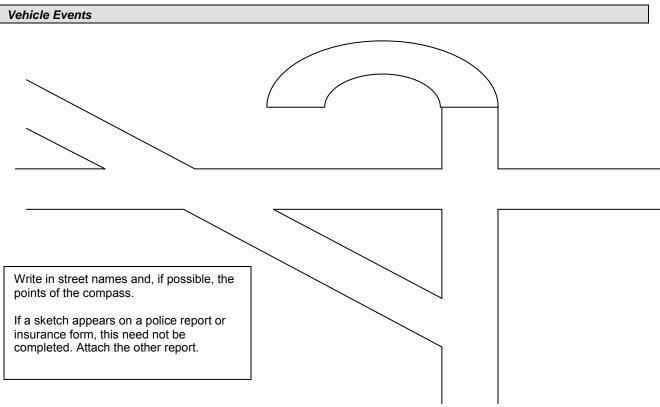
Enter brief combination of each forward to the course had			
Enter brief explanation of each <i>immediate cause</i> below:			
Basic Causes			
What specific personal or job factors contributed to this even	t? Check all that apply:		
Personal Factors	Job Factors		
☐ Inadequate physical/physiological capability	☐ Inadequate leadership and/or supervision		
☐ Inadequate mental/psychological capability	☐ Inadequate engineering		
☐ Physical or physiological stress	☐ Inadequate purchasing		
☐ Lack of knowledge	☐ Inadequate maintenance		
☐ Lack of skill	☐ Inadequate tools and equipment		
☐ Improper motivation	☐ Inadequate work standards		
☐ Other personal factors	☐ Excessive wear and tear		
	☐ Abuse and misuse		
	☐ Change		
☐ Other job factors			
Enter brief explanation of each <i>basic cause</i> below:	,		
Destination Bloom			
Section 10, Action Plan			
What has or should be done to control each of the causes lis developing remedial actions:	ted? Consider the following Management Programs in		
Leadership and administration	☐ Health control		
☐ Training	System evaluation		
☐ Planned inspections	+= -		
	☐ Engineering controls and change management☐ Personal communications		
☐ Task analysis and procedures ☐ Task observation			
-	Group meetings		
Emergency preparedness	General promotion		
Rules and work permits	☐ Hiring and placement		
Accident/event analysis and corrective and preventive act	tion		
Personal protective equipment	1		

Remedial Actions				
Actions	Person Responsible		Target Date	Completion Date
1.	1.			
2.	2.			
3.	3.			
4.	4.			
Section 11, Persons Performing Investigation				
Investigator's name:		Dat	e:	
Investigator's name:		Dat	e:	
Investigator's name:		Dat	e:	
Management Review				
Note: Signature verifies that all supplied information the Action Plan is sufficient to address the causes.		on suj	oports the causa	l analysis; and
Project/Office Manager Approval: ☐ Yes ☐ No				
Comments:				
Sign:	Date	of App	proval:	
ESQ (PESM) Approval: Yes No	1 - 2.11			
Comments:				
Sign:	Date	of App	oroval:	
Note: Attach additional information as necessary. Supe	ervisor to forward copy of Inve	estigati	ve Report to the I	
Manager or ESQ as soon as possible, but no later than Services, within 24 hours of completion of the report. A		copy sh	nall be sent to the	Director, EHS

EHS 1-7, Attachment C Event/Near Miss Report and Investigation Sketch Template and Instructions

Event/Near Miss Report and Investigation Sketch Template







POICE OFFICE.					DATE:	
ROICC OFFICE: _ CONTRACTOR:						
CONTRACT TITLE:					CONTRACT % COMPLETE	
CONTRACTOR SUF	PERINTEN	IDENT:	-			
CATEGORY:						DATE CORRECTED:
PREPARATORY PHASE (Planning) Comments/Notes:	C YES	○ NO	C N/A	1) Activity Hazard Analysis performed and used on the site for each major p	hase of the work?	
	C YES	€ NO	C N/A	2) Are weekly safety meetings and indoctrination held on site and documer	ited for all workers?	
	✓ YES	ONO	○ N/A	3) Is the submitted safety plan on site and in use?		
	○ YES	ONO	C N/A	4) Is the Activity Hazard Analysis reviewed during the preparatory inspectio	n?	
	C YES	○ NO	○ N/A	5) Hazardous materials program in place with MSDS sheets available and m	aintained for easy reference?	
	C YES	C NO	C N/A	6) EM 385-1-1 available on the site?		
	C YES	C NO	O N/A	7) Other? Extra Credit?		
OFFICE TRAILER	YES	ONO	O N/A	8) Are office and storage trailers anchored?		STEVE ASSESSED.
ENERAL	YES	○ NO	O N/A	9) Are emergency phone numbers posted?		
omments/Notes:	○ YES	○ NO	○ N/A	10) Is a phone available?		
	YES	CNO	C N/A	11) First aid log maintained (contractors must use OSHA Form 200)?		
	C YES	CNO	O N/A	12) Toilet facilities available?		
	YES	ONO	○ N/A	13) Site posted "HARD HAT AREA," "NOISE HAZARD," "CONSTRUCTION AREA	"atc as required?	
	YES	ONO	C N/A	14) Garbage cans and dumpsters available?	, etc., us required:	
	YES	○ NO	C N/A	15) Jobsite cleaned daily?		
	YES	ONO	O N/A	16) Is traffic control around site adequate?		
	YES	○ NO	C N/A	17) Other? Extra Credit?		
				, , one country		
IRE PREVENTION omments/Notes:	(YES	() NO	C N/A	18) Are fire extinguishers available, fully charged, and easily visible within 75	feet for low hazard areas?	
omments/Notes.	() YES	C NO	C) N/A	19) Is fuel stored in proper containers		
	CYES	C NO	C N/A	20) Are hot work permits being obtained?		
	(YES	C NO	(N/A	21) Are fire watches provided?		
	C YES	() NO	C N/A	22) Are gas cylinders stored upright and secured with chain or rope?		
	(YES	() NO	C N/A	23) Other? Extra Credit?	The state of the s	HELDING THE REAL PROPERTY OF
	C) YES	() NO	() N/A	24) Other? Extra Credit?		并是是是 董师证明
CAFFOLD	YES	○ NO	C N/A	25) Are daily scaffold inspections performed by designated competent pers	on?	
AFETY omments/Notes:	<u>C</u> YES	C NO	○ N/A	26) Planks overlapped not less than 6" or more than 12" over end supports v	vith toe boards in place?	
on mens/notes	O YES	C) NO	○ N/A	27) Tubing pinned properly and all cross bracing in place?		
	C YES	C NO	N/A	28) If scaffold height is 4X smallest base dimension, is system secured to stru	ucture?	
	C YES	○ NO	€ N/A	29) All guardrails are in place?	0	
	C YES	C NO	○ N/A	30) Full work platform at each working level with no cracks/splits?		
	C YES	○ NO	C N/A	31) Safe access provided to each working level?		
	C YES	○ NO	○ N/A	32) Scaffold and components not overloaded?		
	C YES	○ NO	○ N/A	33) Is scaffold system plumb and level?	= 2	
	○ YES	○ NO	C N/A	34) Suspended scaffold systems using independent personal fall arrest systems	em?	
		○ NO	C N/A	35) Other? Extra Credit?		
ALL	C YES	ONO	O N/A	36) Is a full body harness used where applicable?		CONTRACTOR OF STREET
ROTECTION		ONO	○ N/A	37) Tied off at all times to structural element capable of supporting 5,000 lb	s/person 100%?	205,000,000,000
omments/Notes:	C YES	C NO	O N/A	38) Is protection provided for all working in an area where they could fall 5'		
		C NO	C N/A	39) Are employees trained for fall protection systems in use?		
	(YES	Оио	○ N/A	40) Has the contractor designated a competent person for fall protection?	150	Constitution of the second
	YES	ONO	C N/A	41) Have standard guardrails been provided where needed?		
	YES	CNO	O N/A	42) Have horizontal life lines been designed and installed under supervision	of a qualified person?	
	YES	CNO	C N/A	43) Other? Extra Credit?	n Anna anna de Mariama (merra) de la Maria (maria (m	



ROICC OFFICE:			DATE:			
CONTRACTOR:						
CONTRACT TITLE:			CONTRACT % COMPLETE			
CONTRACTOR SU						
CATEGORY:	-1			DATE CORRECTED:		
ADDER SAFETY Comments/Notes:	0 0		0	I was a supplied to the		
	C YES C NO	N/A 44) Do ladders extend 3' above landing platform and tied to structure?	E011-1112-			
	C YES C NO	N/A 45) Are ladders used with hand tools only?				
	C YES C NO	N/A 46) Are ladder base distances from structure 1/4 height?				
	C YES C NO	() N/A 47) Are floor openings either covered or surrounded by a guardrail?				
	C YES C NO	N/A 48) Electricians not using portable or conductive ladders?				
	C YES C NO	N/A 49) Stainways provided on all structures over 20' during construction and	supplied with guardrail?			
	C YES C NO	N/A 50) Portable step ladders over 20' not used on the site?				
	C YES C NO	N/A 51) Are ladders properly used?				
	C YES C NO	N/A 52) Other? Extra Credit?				
VACUATIONS	C YES C NO	N/A 53) Over 4' deep must have a ladder within 25' and two means of egress?				
Comments/Notes:	C YES C NO	N/A 54) Has proper slope or trench box/shoring been provided?				
	C YES O NO	N/A 55) is water controlled/removed?				
	O YES O NO	N/A 56) Is excavated material at least 2' back from trench edge?				
	C YES C NO	N/A 57) Barricaded, etc., to prevent workers and public from falling into trench	S7) Barricaded, etc., to prevent workers and public from falling into trench/hole?			
	C YES C NO	N/A 58) In locations of known or suspected contamination, is excavation atmo				
	C YES C NO	N/A 59) Other? Extra Credit?				
	C YES C NO	N/A 60) Other? Extra Credit?				
ELECTRICAL	C YES C NO	C N/A 61) Are temporary power panel and receptacles protected from weather?				
Comments/Notes:	C YES C NO	N/A 62) GFI's in use for site tools - applies to existing outlets in renovation pro	Jects as well?			
	O YES O NO	N/A 63) Temporary lights rigged and secured to supports properly with cover	s?	公园中 农村成为		
	C YES C NO	N/A 64) If overhead power lines in area, are operations maintaining 10' distan	ce or isolation?			
	C YES C NO	N/A 65) Is lockout/tagout program in effect?				
	C YES C NO	N/A 66) Sketch of proposed temporary power distribution been submitted/ac	cepted before installing?	10年2月1日 李丰元		
	C YES C NO	N/A 67) Other? Extra Credit?	20			
	C YES C NO	N/A 68) Other? Extra Credit?		. 并一定是这种证		
CRANES Comments/Notes:	C YES C NO	N/A 69) Has periodic inspection been performed prior to use on site IAW EM	385-1-1, App. H?			
	C YES C NO	N/A 70) Are App. H daily start up inspections performed by operator and sub-	mitted with DRI?			
	CYES CNO	N/A 71) Is crane operator qualified IAW EM 385-1-1, App. G, and is crane certif	fication posted in cab?			
	C YES C NO	N/A 72) Are workers protected from the crane swing radius and prevented from				
	C YES C NO	N/A 73) Are rigging cables and slings in good repair free of kinks and cracks?				
	C YES C NO	N/A 74) Is the crane level and on firm ground and outriggers in use with appr	opriate cribbing?			
	C YES C NO	N/A 75) Is crane side loading prohibited?				
	C YES C NO	N/A 76) Near electric power sources, are rules followed for clearance/isolation	n in operating zone?			
	C YES C NO	N/A 77) Is crane equipped with anti two-block device if required?		AND SELECTION		
	C YES C NO	N/A 78) Other? Extra Credit?				



ROICC OFFICE:				DATE:	
CONTRACTOR:				v	
CONTRACT TITLE:				CONTRACT % COMPLETE	
CONTRACTOR SUP		IDENT:			
CATEGORY:		Dairri			DATE CORRECTED.
CATEGORY.		/			DATE CORRECTED:
CONFINED SPACES Comments/Notes:	C YES	CNO	O N/A	79) Has entry plan been submitted and accepted?	
	C YES	CNO	○ N/A	80) Is atmosphere being monitored?	
	CYES	○ NO	○ N/A	81) Is space being ventilated?	ALL WAR PERSON
	CYES	○ NO	C N/A	82) Are entrants, attendants and entry supervisor properly trained?	
	O YES	○ NO	O N/A	83) Is rescue/retrieval system in place?	
	C YES	C NO	○ N/A	84) Are daily entry permits posted at point of entry and signed by entry supervisor?	
	YES	○ NO	C N/A	85) Is point of entry posted "DANGER CONFINED SPACE"?	
	YES	○ NO	C N/A	86) Has blanking or locking out of systems taken place?	
	C YES	ONO	○ N/A	87) Other? Extra Credit?	
ROOFING	YES	C NO	○ N/A	88) Are kettles at least 25 feet away from building?	atom adaptitions
omments/Notes:	CYES	ONO	C N/A	89) Has an employee fall protection system been implemented and in proper use?	
	YES	CNO	O N/A	90) Are skylights and roof penetrations covered or barricaded appropriately?	
	C YES	○ NO	○ N/A	91) Has the roof been evaluated for its ability to support the intended construction loads?	
	YES	CNO	C N/A	92) Has the roof been surveyed for deterioration?	
	YES	ONO	O N/A	93) Are two fire extinguishers at the kettle?	
	YES	CNO	C N/A	94) Fuel cylinder a minimum of 10' from open flame?	
	YES	○ NO	C N/A	95) Other? Extra Credit?	
	○ YES	CNO	C N/A	96) Other? Extra Credit?	
	YES	ONO	C N/A		Demonstrate Design
QUIPMENT omments/Notes:	YES		C N/A	97) Are forklift operators qualified through training at the site (certificate included in Safety Plan)?	
		C NO	C N/A	98) Mobile equipment equipped with rollover cages and backup alarms with moving parts adequately guarded?	
	() YES	() NO	C N/A	99) Are equipment operations maintaining safe clearance from electrical power lines?	
	(YES	C No	C N/A	100) Modifications meet safety rating in accordance with manufacturer (i.e., lifting personnel with forklift)?	A MANAGE TO THE PARTY OF THE PA
	C YES	CNO	() N/A	101) Are safety lashings provided for high pressure hose connections (i.e., air compressors)?	
	C YES	(NO	(N/A	102) Are workers clear of blind spots associated with mobile construction equipment?	
	(YES	(NO	() N/A	103) Do aerial lifts have basket/platform with guardrail?	
	() YES	(NO	C N/A	104) Workers not extending over guardrail of aerial lifts?	
	(YES	CNO	C N/A	105) Are articulating boom platforms (JLG type) used with Full Body Harness attached to boom or basket?	
	YES	CNO	C N/A	106) Other? Extra Credit?	
	() YES	(NO	C N/A	107) Other? Extra Credit?	Controller Care
DEMOLITION Comments/Notes:	YES	C NO	O N/A	108) Has demolition plan been submitted and accepted?	
	YES	C NO	O N/A	109) Waste not being dropped > 6' unless in an enclosed chute and area secured from traffic?	Green Warding
	YES	C NO	C N/A	110) Has an engineering survey been prepared for structural elements?	
	YES	C NO	C N/A	111) Are removal operations from the top down?	
	C YES	○ NO	C N/A	112) Are all floor and wall openings covered or guarded to prevent falls?	
	YES	ONO	C N/A	113) For building demolition, has notification been made to State having jurisdiction?	
	C YES	Оио	○ N/A	114) Are nails removed from scrap lumber/materials?	
	CYES	CNO	O N/A	115) Other? Extra Credit?	
	YES	CNO	C N/A	116) Other? Extra Credit?	



ROICC OFFICE:				DATE:		
CONTRACTOR:			8			
CONTRACT TITLE	•			CONTRACT % COMPLETE		
CONTRACTOR SU	IPERINTENDENT:					
CATEGORY:					DATE CORRECTED:	
PPE Comments/Notes:	C YES C NO	ON/A 117)	Workers wearing leather shoes (no tennis shoes), long pants and	I sleeve shirt?	to longit e little de la co	
	C YES C NO	○ N/A 118)	Hard hats being worn?	9		
	C YES C NO	O N/A 119)	Safety glasses where appropriate?	_		
	C YES ONO	O N/A 120) I	Hearing protection where appropriate? (if you need to yell to co			
	O YES O NO	C N/A 121) I	Respirators where appropriate?			
	O YES O NO	○ N/A 122) I	122) Impalement protection provided where personnel could work above vertical impalement?			
	O YES O NO	○ N/A 123) I	s lighting adequate?			
	C YES C NO	○ N/A 124)	Other? Extra Credit?			
				9		
ABATEMENT	C YES C NO	O N/A 125) I	Has abatement plan been submitted and accepted?			
Comments/Notes:	C YES O NO	_	is independent air monitoring being performed as required insid	de and outside barriers?		
	O YES O NO	○ N/A 127) I	s containment in place without integrity compromise?	W)		
	C YES C NO	O N/A 128) /	Are employees utilizing appropriate PPE?	=		
	C YES C NO	(N/A 129) I	f negative air is used, are fans used continuously and monitored	for pressure differential?		
	C YES C NO	O N/A 130) F	Has baseline been performed and necessary final clearance read	ings taken?		
	C YES C NO	O N/A 131) /	Are inspections by independent PQP performed prior to barrier i	removal?	The Continue	
	C YES C NO	C N/A 132) I	s waste material properly containerized and stored?			
	C YES C NO	O N/A 133) /	Are air monitoring results provided to ROICC?			
	O YES O NO	○ N/A 134) /	Are waste shipment records provided to ROICC?		ALTO VIEW STATE	
	C YES C NO	(N/A 135) (Other? Extra Credit?			
WATERFRONT	O YES O NO	O N/A 136)	Are employees wearing appropriate flotation devices (PFDs)?			
ACTIVITIES	C YES C NO	C N/A 137) I	s a space rescue skiff available?	7		
Comments/Notes:	C YES C NO		Are emergency life rings available?	34		
	C YES C NO	C N/A 139) I	f diving operations are taking place, has a dive plan been submi	tted and accepted?		
	C YES C NO	C N/A 140) [Does dive team consist of proper number and qualifications for o	employees?		
	C YES C NO	C N/A 141) (Other? Extra Credit?			
Tota SCORE FOR EACH 1 PREPARATORY PHASE 2 OFFICE TRAILER GENE 3 FIRE PREVENTION:	al with "Yes" respor CATEGORY: E: CRAL:	SCORE RATE E	G LADDER SAFETY: 7 EVACUATIONS: 8 ELECTRICAL:	11 ROOFING: 12 EQUIPMENT: 13 DEMOLITION:		
4 SCAFFOLD SAFETY:			9 CRANES:	14 PPE:		
5 FALL PROTECTION:			10 CONFINED SPACES:	15 ABATEMENT:		
				16 WATERFRONT ACTIVITIES:		

OVERALL RATING = LOWEST RATING FOR ANY CATEGORY:

OVERALL COMPOSITE SCORE = (All "No" answers/All "Yes" answers):